HITACHI

PA | **No. 0060**

60SX10BA/11KA
50UX22BA/23KA
46UX20BA/21KA
50SX7PA

SERVICE MANUAL

NTSC | AP53P/DP Chassis

R/C: CLU-951MP

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CAUTION: Before servicing this chassis, it is important that the service technician read the "Safety Precaution" and "Product Safety Notices" in this Service Manual.

SAFETY NOTICE
USE ISOLATION TRANSFORMER WHEN SERVICING

Components having special safety characteristics are identified by a ⚠ on the schematics and on the parts list in this Service Data and its supplements and bulletins. Before servicing the chassis, it is important that the service technician read and follow the "Safety Precautions" and "Product Safety Notices" in this Service Manual.

*For continued x-radiation protection, replace picture tube with original type of Hitachi approved equivalent type.

SPECIFICATIONS AND PARTS ARE SUBJECT TO CHANGE FOR IMPROVEMENT

PROJECTION COLOR TELEVISION

November 1995 HHEA - MANUFACTURING DIVISION

This service manual is intended for qualified service technicians; it is not meant for the casual do-it-yourselfer. Qualified technicians have the necessary test equipment and tools, and have been trained to properly and safely repair complex products such as those covered by this manual.

Improperly performed repairs can adversely affect the safety and reliability of the product and may void warranty. If you are not qualified to perform the repair of this product properly and safely, you should not risk trying to do so and refer the repair to a qualified service technician.

WARNING

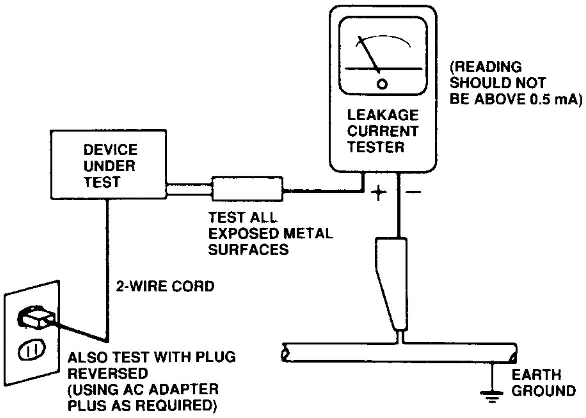
Lead in solder used in this product is listed by the California Health and Welfare agency as a known reproductive toxicant which may cause birth defects or other reproductive harm (California Health and Safety Code, Section 25249.5).

When servicing or handling circuit boards and other components which contain lead in solder, avoid unprotected skin contact with solder. Also, when soldering do not inhale any smoke or fumes produced.

This television receiver provides display of television closed captioning in accordance with section 5.119 of the FCC rules.

SAFETY PRECAUTIONS

1. Before returning an instrument to the customer, always make a safety check of the entire instrument, including but not limited to the following items:
   a. Be sure that no built-in protective devices are defective and/or have been deleted during servicing. (1) Protective shields are provided on this chassis to protect both the technician and the customer. Correctly replace all missing protective shields, including any removed for servicing convenience. (2) When reinstalling the chassis and/or other assembly in the cabinet, be sure to put back in place all protective devices, including but not limited to, nonmetallic control knobs, insulating fishpapers, adjustment and compartment covers/shields, and isolation resistor/capacitor networks. **Do not operate this instrument or permit it to be operated without all protective devices correctly installed and functioning. Servicers who defeat safety features or fail to perform safety checks may be liable for any resulting damage.**
   b. Be sure that there are no cabinet openings through which an adult or child might be able to insert their fingers and contact a hazardous voltage. Such openings include, but are not limited to (1) spacing between the picture tube and cabinet mask, (2) excessively wide cabinet ventilation slots, and (3) an improperly fitted and/or incorrectly secured cabinet back cover.
   c. **Antenna Cold Check** — With the instrument AC plug removed from any AC source, connect an electrical jumper across the two AC plug prongs. Place the instrument AC switch in the on position. Connect one lead of an ohmmeter to the AC plug prongs tied together and touch the other ohmmeter lead in turn to each tuner antenna input exposed terminal screw and, if applicable, to the coaxial connector. If the measured resistance is less than 1.0 megohms or greater than 5.2 megohms, an abnormality exists that must be corrected before the instrument is returned to the customer. Repeat this test with the instrument AC switch in the off position.
   d. **Leakage Current Hot Check** —With the instrument completely reassembled, plug the AC line cord directly into a 120V AC outlet. (Do not use an isolation transformer during this test.) Use a leakage current tester or a metering system that complies with American National Standards Institute (ANSI) C101.0 Leakage Current for Appliances and Underwriters Laboratories (UL) 1410, (50.7). With the instrument AC switch first in the on position and then in the off position, measure from a known earth ground (metal waterpipe, conduit, etc.) to all exposed metal parts of the instrument (antennas, handle bracket, metal cabinet, screw heads, metallic overlays, control shafts, etc.), especially any exposed metal parts that offer an electrical return path to the chassis. Any current measured must not exceed 0.1 milliamps. Reverse the instrument power cord plug in the outlet and repeat test.

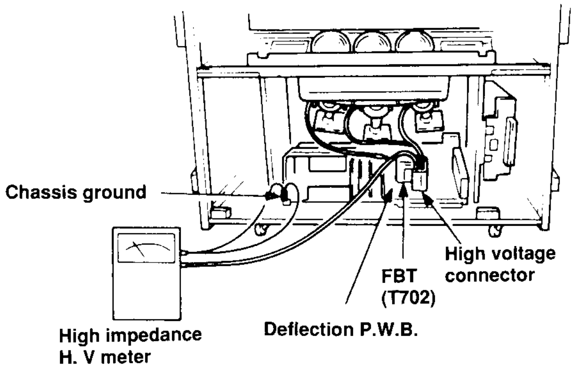

(READING SHOULD NOT BE ABOVE 0.5 mA)
LEAKAGE CURRENT TESTER
DEVICE UNDER TEST
+
−
TEST ALL EXPOSED METAL SURFACES
2-WIRE CORD
ALSO TEST WITH PLUG REVERSED (USING AC ADAPTER PLUS AS REQUIRED)
EARTH GROUND

AC Leakage Test

ANY MEASUREMENTS NOT WITHIN THE LIMITS SPECIFIED HEREIN INDICATE A POTENTIAL SHOCK HAZARD THAT MUST BE ELIMINATED BEFORE RETURNING THE INSTRUMENT TO THE CUSTOMER OR BEFORE CONNECTING THE ANTENNA OR ACCESSORIES.

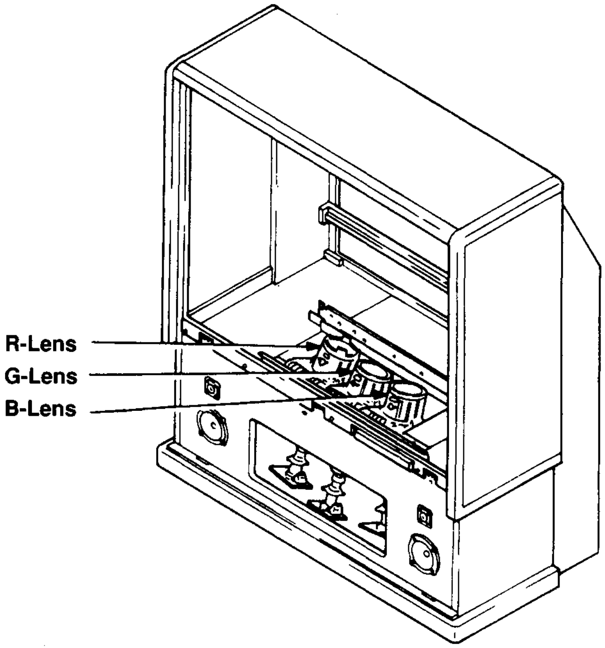
   e. **High Voltage** —This receiver is provided with a hold down circuit for clearly indicating that voltage has increased in excess of a predetermined value. Comply with all notes described in this Service Manual regarding this hold down circuit when servicing, so that this hold down circuit may correctly be operated.
   f. **Serviceman Warning** — With minimum contrast and brightness, operating high voltage in this receiver is lower than **31.6kV.** In case any component having influence on high voltage is replaced, confirm that high voltage with minimum contrast and brightness is lower than **31.6kV.**
   To measure H.V. use a high impedance H.V. meter. Connect (-) to chassis earth and (+) to the CRT anode button. (See the following connection diagram.)

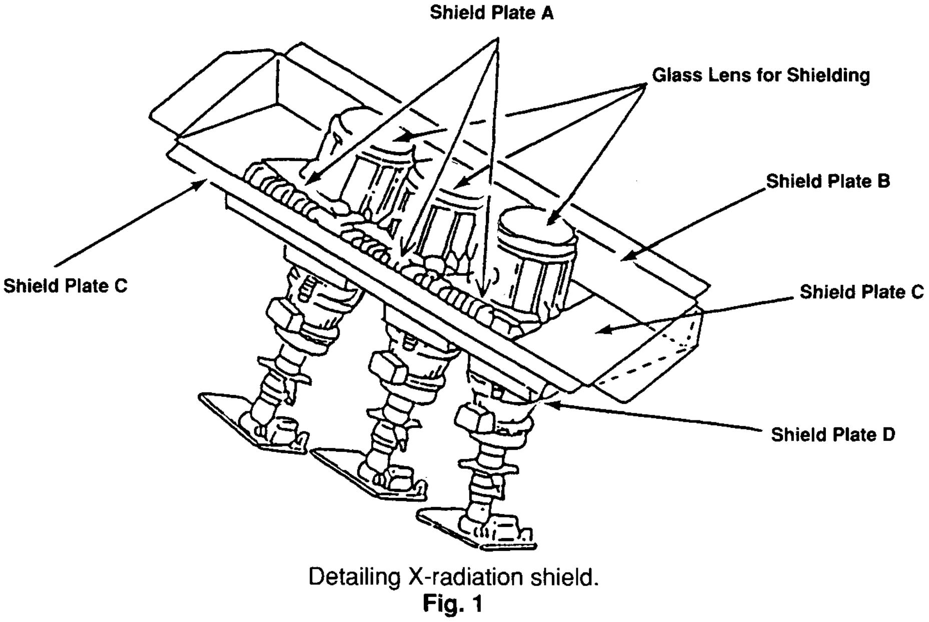
   Note: Turn power switch off without fail before the connection to the anode button is made.



g. **X-radiation — TUBE:** The primary source of X radiation in this receiver is the picture tube. The tube utilized for the above mentioned function in this chassis is specially constructed to limit X radiation emissions.
For continued X radiation protection, the replacement tube must be the same type as the original, HITACHI approved type.
When troubleshooting and making test measurements in a receiver with a problem of excessive high voltage, avoid being unnecessarily close to the picture tube and the high voltage component.
Do not operate the chassis longer than is necessary to locate the cause of excessive voltage.

h. **X-Radiation Shield —**
1) This receiver is provided X-ray shield plates for the protection of X-radiation. Do not remove X-ray shield plates A, B, C, or D shown in Fig. 1 unnecessarily, when troubleshooting and/or making test measurements.
2) To prevent X-radiation, after replacement of picture tube and lens, confirm these components to be fixed correctly to bracket and cabinet, and not to be taken off easily.





Detailing X-radiation shield.
Fig. 1

2. Read and comply with all caution and safety-related notes on or inside the receiver cabinet, on the receiver chassis, or on the picture tube.

3. **Design Alteration Warning** — Do not alter or add to the mechanical or electrical design of this TV receiver. Design alterations and additions, including but not limited to, circuit modifications and the addition of items such as auxiliary audio and/or video output connectors, might alter the safety characteristics of this receiver and create a hazard to the user. Any design alterations or additions may void the manufacturer's warranty and may make you, the servicer, responsible for personal injury or property damage resulting therefrom.

4. **Picture Tube Implosion Protection Warning** — The picture tube in this receiver employs integral implosion protection. For continued implosion protection, replace the picture tube only with one of the same type number. Do not remove, install, or otherwise handle the picture tube in any manner without first putting on shatterproof goggles equipped with side shields. People not so equipped must be kept safely away while picture tubes are handled. Keep the picture tube away from your body. Do not handle the picture tube by its neck.

5. **Hot Chassis Warning** — **a.** Some TV receiver chassis are electrically connected directly to one conductor of the AC power cord and may be safety serviced without an isolation transformer only if the AC power plug is inserted so that the chassis is connected to the ground side of the AC power source. To confirm that the AC power plug is inserted correctly, with an AC voltmeter measure between the chassis and a known earth ground. If a voltage reading in excess of 1.0V is obtained, remove and reinsert the AC power plug in the opposite polarity and again measure the voltage potential between the chassis and a known earth ground. **b.** Some TV receiver chassis normally have 85V AC (RMS) between chassis and earth ground regardless of the AC plug polarity. These chassis can be safely serviced only with an isolation transformer inserted in the power line between the receiver and the AC power source, for both personnel and test equipment protection. **c.** Some TV receiver chassis have a secondary ground system in addition to the main chassis ground. This secondary ground system is not isolated from the AC power line. The two ground systems are electrically separated by insulating material that must not be defeated or altered.

6. Observe original lead dress. Take extra care to assure correct lead dress in the following areas: **a.** near sharp edges, **b.** near thermally hot parts — be sure that leads and components do not touch thermally hot parts, **c.** the AC supply, **d.** high voltage and **e.** antenna wiring. Always inspect in all areas for pinched, out-of-plate, or frayed wiring. Do not change spacing between components, and between components and the printed circuit board. Check AC power cord for damage.

7. Components, parts, and/or wiring that appear to have overheated or are otherwise damaged should be replaced with components, parts, or wiring that meet original specifications. Additionally, determine the cause of overheating and/or damage and, if necessary, take corrective action to remove any potential safety hazard.

8. **PRODUCT SAFETY NOTICE** — Many TV electrical and mechanical parts have special safety-related characteristics some of which are often not evident from visual inspection, nor can the protection they give necessarily be obtained by replacing them with components rated for higher voltage, wattage, etc. Parts that have special safety characteristics are identified Hitachi service data by shading on schematics and by a (⚠) in the parts list. Use of a substitute replacement that does not have the same safety characteristics as the recommended replacement part in Hitachi service data parts list might create shock, fire, and/or other hazards. Product safety is under review continuously and new instructions are issued whenever appropriate. For the latest information, always consult the appropriate current Hitachi service literature. A subscription to, or additional copies of Service literature may be obtained at a nominal charge from Hitachi.

SERVICING PRECAUTIONS

CAUTION: Before servicing instruments covered by this service data and its supplements and addenda, read and follow the SAFETY PRECAUTIONS on page 3 of this publication.

NOTE: If unforeseen circumstances create conflict between the following servicing precautions and any of the safety precautions on page 3 of this publication, always follow the safety precautions. Remember: Safety First.

General Servicing Guidelines

1. Always unplug the instrument AC power cord from the AC power source before:
   a. Removing or reinstalling any component, circuit board, module, or any other instrument assembly.
   b. Disconnecting or reconnecting any instrument electrical plug or other electrical connection.
   c. Connecting a test substitute in parallel with an electrolytic capacitor in the instrument.
   Caution: A wrong part substitution or incorrect polarity installation of electrolytic capacitors may result in an explosion hazard.
   d. Discharging the picture tube anode.
2. Test high voltage only by measuring it with an appropriate high voltage meter or other voltage measuring device (DVM, FETVOM, etc.) equipped with a suitable high voltage probe. Do not test high voltage by "drawing an arc." The H.V. Distribution Box has an internal 400MΩ resistor (bleeder resistor) connected from the high voltage to ground. After power is removed from the instrument the high voltage will discharge through the high voltage bleeder resistor. If the tubes have high voltage after power is removed, then the bleeder resistor is defective or the bleeder ground is disconnected.
3. Discharge the picture tube's anode at any of the R, G, or B outputs on the High Voltage distribution box only by (a) first connecting one end of an insulated clip lead to the degaussing or kine aquadag grounding system shield at the point where the picture tube socket ground lead is connected, and then (b) touch the other end of the insulated clip lead to the picture tube high voltage distribution box R, G, or B output, using an insulating handle to avoid personal contact with high voltage.
4. Do not spray chemical on or near this instrument or any of its assemblies.
5. Unless specified otherwise in these service data, clean electrical contacts by applying the following mixture to the contacts with a pipe cleaner, cotton-tipped stick or comparable nonabrasive applicator: 10% (by volume) Acetone and 90% (by volume) isopropyl alcohol (90%-99% strength). **Caution:** This is a flammable mixture. Unless specified otherwise in these service data, lubrication of contacts is not required.
6. Do not defeat any plug/socket B+ voltage interlocks with which instruments covered by this service data might be equipped.
7. Do not apply AC power to this instrument and/or any of its electrical assemblies unless all solid-state device heat sinks are correctly installed.
8. Always connect the test instrument ground lead to the appropriate instrument chassis ground before connecting the test instrument positive lead. Always remove the test instrument ground lead last.
9. Use with this instrument only the test fixtures specified in this service data.
   CAUTION: Do not connect the test fixture ground strap to any heatsink in this instrument.

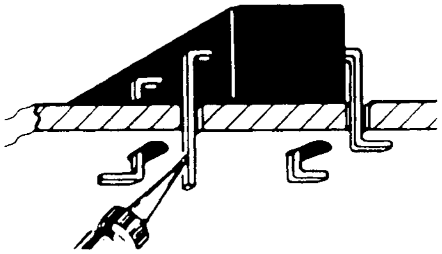
Electrostatically Sensitive (ES) Devices

Some semiconductor (solid state) devices can be damaged easily by static electricity. Such components commonly are called Electrostatically Sensitive (ES) Devices. Examples of typical ES devices are integrated circuits and some field-effect transistors and semiconductor "chip" components. The following techniques should be used to help reduce the incidence of component damage caused by static electricity.

1. Immediately before handling any semiconductor component or semiconductor-equipped assembly, drain off any electrostatic charge on your body by touching a known earth ground. Alternatively, obtain and wear a commercially available discharging wrist strap device, which should be removed for potential shock reasons prior to applying power to the unit under test.
2. After removing an electrical assembly equipped with ES devices, place the assembly on a conductive surface such as aluminum foil, to prevent electrostatic charge buildup or exposure of the assembly.
3. Use only a grounded-tip soldering iron to solder or unsolder ES devices.
4. Use only an anti-static type solder removal device Some solder removal devices not classified as "anti-static" can generate electrical charges sufficient to damage ES devices.
5. Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damage ES devices.
6. Do not remove a replacement ES device from its protective package until immediately before you are ready to install it. (Most replacement ES devices are packaged with leads electrically shorted together by conductive foam, aluminum foil or comparable conductive material.)
7. Immediately before removing the protective material from the leads of a replacement ES device, touch the protective material to the chassis or circuit assembly into which the device will be installed.
   CAUTION: Be sure no power is applied to the chassis or circuit, and observe all other safety precautions.
8. Minimize bodily motions when handling unpackaged replacement ES devices. (Otherwise harmless motion such as the brushing together of your clothes fabric or the lifting of your foot from a carpeted floor can generate static electricity sufficient to damage an ES device.)

General Soldering Guidelines

1. Use a grounded-tip, low-wattage soldering iron and appropriate tip size and shape that will maintain tip temperature within the range 500°F to 600°F.
2. Use an appropriate gauge of resin-core solder composed of 60 parts tin/40 parts lead.
3. Keep the soldering iron tip clean and well tinned.
4. Thoroughly clean the surfaces to be soldered. Use a small wire-bristle (0.5 inch or 1.25 cm) brush with a metal handle. Do not use freon-propelled spray-on cleaners.
5. Use the following unsoldering technique.
    a. Allow the soldering iron tip to reach normal temperature (500°F to 600°F).
    b. Heat the component lead until the solder melts. Quickly draw away the melted solder with an anti-static, suction-type solder removal device or with solder braid.
    CAUTION: Work quickly to avoid overheating the circuit board printed foil.
6. Use the following soldering technique.
    a. Allow the soldering iron tip to reach normal temperature (500°F to 600°F).
    b. First, hold the soldering iron tip and solder strand against the component lead until the solder melts.
    c. Quickly move the soldering iron tip to the junction of the component lead and the printed circuit foil, and hold it there only until the solder flows onto and around both the component lead and the foil.
    CAUTION: Work quickly to avoid overheating the circuit board printed foil or components.
    d. Closely inspect the solder area and remove any excess or splashed solder with a small wire-bristle brush.



Use Soldering Iron to Pry Leads

IC Removal/Replacement

Some Hitachi unitized chassis circuit boards have slotted holes (oblong) through which the IC leads are inserted and then bent flat against the circuit foil. When holes are the slotted type, the following technique should be used to remove and replace the IC. When working with boards using the familiar round hole, use the standard technique as outlined in paragraphs 5 and 6 above.

Removal

1. Desolder and straighten each IC lead in one operation by gently prying up on the lead with the soldering iron tip as the solder melts.
2. Draw away the melted solder with an anti-static suction-type solder removal device (or with solder braid) before removing the IC.

Replacement

1. Carefully insert the replacement IC in the circuit board.
2. Carefully bend each IC lead against the circuit foil pad and solder it.
3. Clean the soldered areas with a small wire-bristle brush. (It is not necessary to reapply acrylic coating to the areas.)

"Small-signal" Discrete Transistor Removal/Replacement

1. Remove the defective transistor by clipping its leads as close as possible to the component body.
2. Bend into a "U" shape the end of each of three leads remaining on the circuit board.
3. Bend into a "U" shape the replacement transistor leads.
4. Connect the replacement transistor leads to the corresponding leads extending from the circuit board and crimp the "U" with long nose pliers to insure metal to metal contact, then solder each connection.

Power Output Transistor Devices Removal/Replacement

1. Heat and remove all solder from around the transistor leads.
2. Remove the heatsink mounting screw (if so equipped).
3. Carefully remove the transistor from the circuit board.
4. Insert new transistor in circuit board.
5. Solder each transistor lead, and clip off excess lead.
6. Replace heatsink.

Diode Removal/Replacement

1. Remove defective diode by clipping its leads as close as possible to diode body.
2. Bend the two remaining leads perpendicularly to the circuit board.
3. Observing diode polarity, wrap each lead out of the new diode around the corresponding lead on the circuit board.
4. Securely crimp each connection and solder it.
5. Inspect (on the circuit board copper side) the solder joints of the two "original" leads. If they are not shiny, reheat them and, if necessary, apply additional solder.

Fuses and Conventional Resistor Removal/Replacement

1. Clip each fuse or resistor lead at top of circuit board hollow stake.
2. Securely crimp leads of replacement component around stake 1/8 inch from top.
3. Solder the connections.

CAUTION: Maintain original spacing between the replaced component and adjacent components and the circuit board, to prevent excessive component temperatures.

Circuit Board Foil Repair

Excessive heat applied to the copper foil of any printed circuit board will weaken the adhesive that bonds the foil to the circuit board, causing the foil to separate from, or "lift-off," the board. The following guidelines and procedures should be followed whenever this condition is encountered.

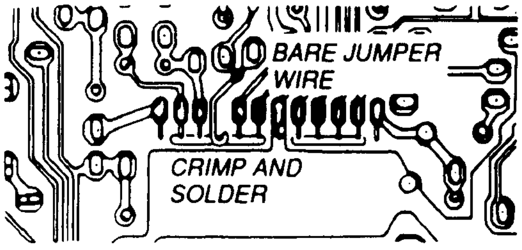
In Critical Copper Pattern Areas

High component/copper pattern density and/or special voltage/current characteristics make the spacing and integrity of copper pattern in some circuit board areas more critical than in others. The circuit foil in these areas is designated as Critical Copper Pattern and is identified and illustrated in this service data in the section titled Safety Related Copper Pattern (see data in the section titled Safety Related Copper Pattern (see table of contents for page number). Because Critical Copper Pattern requires special soldering techniques to ensure the maintenance of reliability and safety standards, contact your Hitachi personnel.

At IC Connections

To repair defective copper pattern at IC connections, use the following procedure to install a jumper wire on the copper pattern side of the circuit board. (Use this technique only on IC connections.)

1. Carefully remove the damaged copper pattern with a sharp knife. (Remove only as much copper as absolutely necessary.)
2. Carefully scratch away the solder resist and acrylic coating (if used) from the end of the remaining copper pattern.

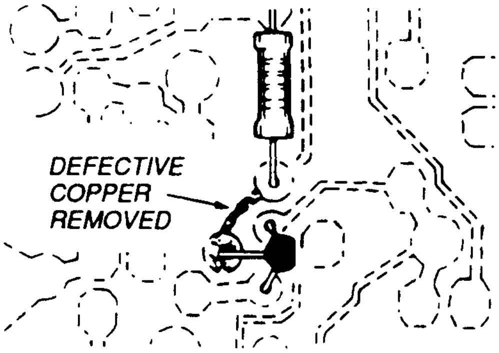


Install Jumper Wire and Solder

3. Bend a small "U" in one end of a small-gauge jumper wire and carefully crimp it around the IC pin. Solder the IC connection.
4. Route the jumper wire along the path of the cut-away copper pattern and let it overlap the previously scraped end of the good copper pattern. Solder the overlapped area, and clip off any excess jumper wire.

At Other connections

Use the following technique to repair defective copper pattern at connections other than IC Pins. This technique involves the installation of a jumper wire on the component side of the circuit board.



Insulated Jumper Wire

1. Remove the defective copper pattern with a sharp knife. Remove at least 1/4 inch of copper, to ensure that a hazardous condition will not exist if the jumper wire opens.
2. Trace along the copper pattern from both sides of the pattern break and locate the nearest component that is directly connected to the affected copper pattern.
3. Connect insulated 20-gauge jumper wire from the lead of the nearest component on one side of the pattern break to the lead of the nearest component on the other side. Carefully crimp and solder the connections.

CAUTION: Be sure the insulated jumper wire is dressed so that it does not touch components or sharp edges.

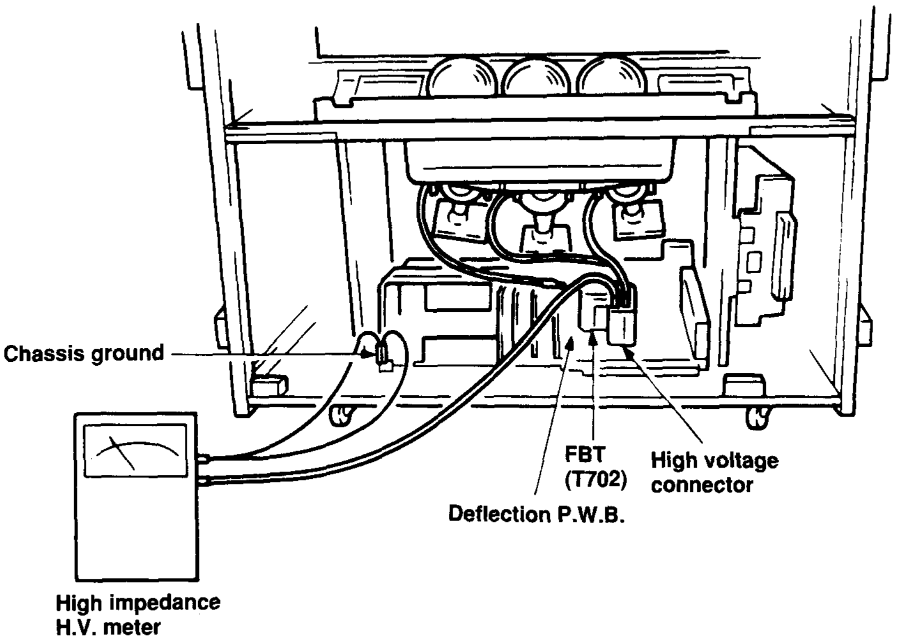
Frequency Synthesis (FS) Tuning Systems

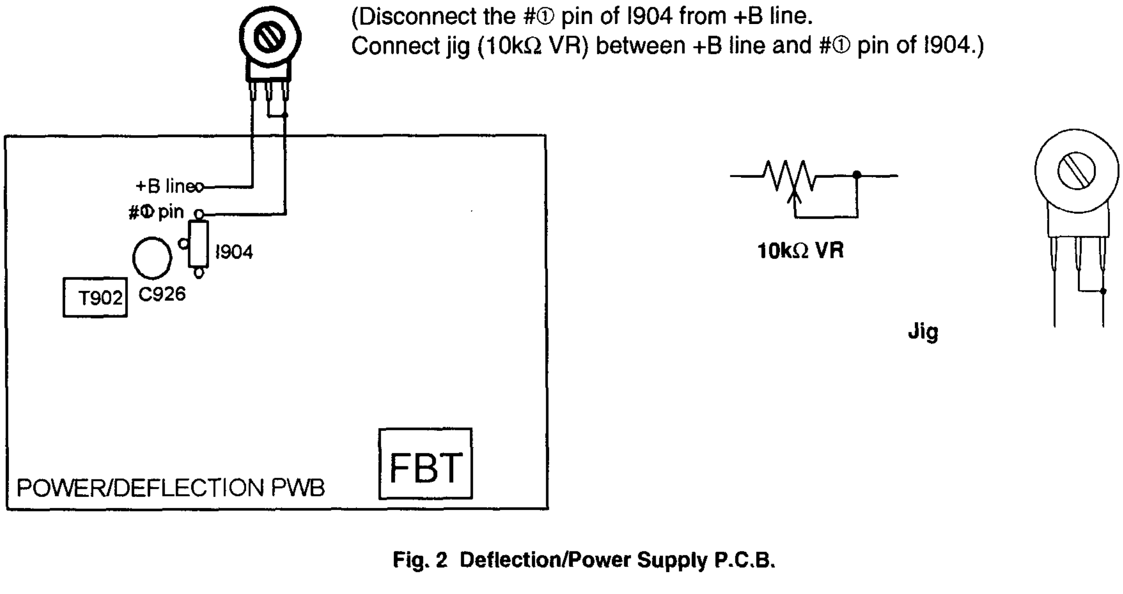
1. Always unplug the instrument AC power cord before disconnecting or reconnecting FS tuning system cables and before removing or inserting FS tuning system modules.
2. The FS tuner must never be disconnected from the FS tuning control module while power is applied to the instrument.
3. When troubleshooting intermittent problems that might be caused by defective cable connection(s) to the FS tuning system, remove the instrument AC power as soon as the defective connector is found and finish confirming the bad connection with a continuity test. This procedure will reduce the probability of electrical overstress of the FS system semi-conductor components.

TECHNICAL CAUTIONS

High Voltage limiter circuit operation check.

1. Turn off TV and connect jig as shown in Figure 2. Adjust jig fully counter-clockwise for minimum resistance.
2. Set the AC input to 120V AC and turn on TV.
3. Confirm test pattern on CRT is a usable picture, then slowly adjust jig until the picture disappears and TV shuts down.
4. When the limiter circuit is operating properly, High Voltage will be less than 35.5kV at 0.6mA when TV shuts down.
5. Turn off set immediately after checking circuit operation.
6. Unplug set for one minute to reset shutdown circuit. Remove jig and voltmeter.


Chassis ground
FBT
(T702)
High voltage
connector
Deflection P.W.B.
High impedance
H.V. meter


(Disconnect the #① pin of I904 from +B line.
Connect jig (10kΩ VR) between +B line and #① pin of I904.)

+B line
#① pin
I904
T902
C926
POWER/DEFLECTION PWB
FBT
10kΩ VR
Jig

Fig. 2 Deflection/Power Supply P.C.B.

SPECIFICATIONS

Model: 60SX10BA 60SX11KA
50UX22BA 50UX23KA
46UX20BA 46UX21KA
50SX7PA

Cathode-Ray Tube: 80° deflection 6.9 inch

60SX10BA/11KA, 50SX7PA	**50UX22BA/23KA, 46UX20BA/21KA**
P16LGD00RFA(R),	P16LEN00RFA(R),
P16LGD00HLA(G),	P16LEN00HLA(G),
P16LGD00BMB(B)	P16LEN00BMB(B)

Power Input: 120 volts AC, 60Hz

Power Consumption: 240 watts - Maximum
165 watts - Operating
(50UX22BA/23KA, 46UX20BA/21KA)
162 watts - Operating
(60SX10BA/11KA, 50SX7PA)

Antenna Impedance: 75 ohm Unbalanced
VHF/UHF/CATV

Receiving Channel:

	CH
VHF	2-13
EXT. Mid	(A-2)-(A-1),4⁺
CATV Mid	A-I
CATV Super	J-W
CATV Hyper	(W+29)-(W+53)

Intermediate Frequency: Picture I-F Carrier 45.75 MHz
Sound I-F Carrier 41.25 MHz
Color Sub Carrier 42.17 MHz

Video Input: 1 Voltp-p 75 ohm

Video Output: 1 Voltp-p 75 ohm

Audio Input: 0.47 volt rms, 47 k ohm

Stereo Audio Output: 0.47 volt rms, 1 k ohm

Audio Output Power: Front — 10 watts rms per channel, 8 ohm impedance.
Max output — 15 watts
Rear — 5 watts per channel, 8 ohm impedance.
Max output — 7 watts.
Center — 7 watts per channel.

Anode Voltage: 30.0 kV
(Zero Beam Current)

Brightness: 500 ft-Nominal - (46UX20BA/21KA)
420 ft-Nominal - (50UX22BA/23KA)
380 ft-Nominal - (50SX7PA)
250 ft-Nominal - (60SX10BA/11KA)
(Peak White)

Speakers: 2 Woofers - 5 inch
(12 cm) round
2 Tweeters - 2 inch
(5 cm) round
1 Full Range - 3x5 inch
(7.5x12cm)

Dimension:

	46UX20BA/21KA	**50UX22BA/23KA**
Height (in.)	48-3/8	50-13/16
Width (in.)	40	43-1/4
Depth (in.)	22-1/2	21-7/16
Weight (lbs.)	221	250

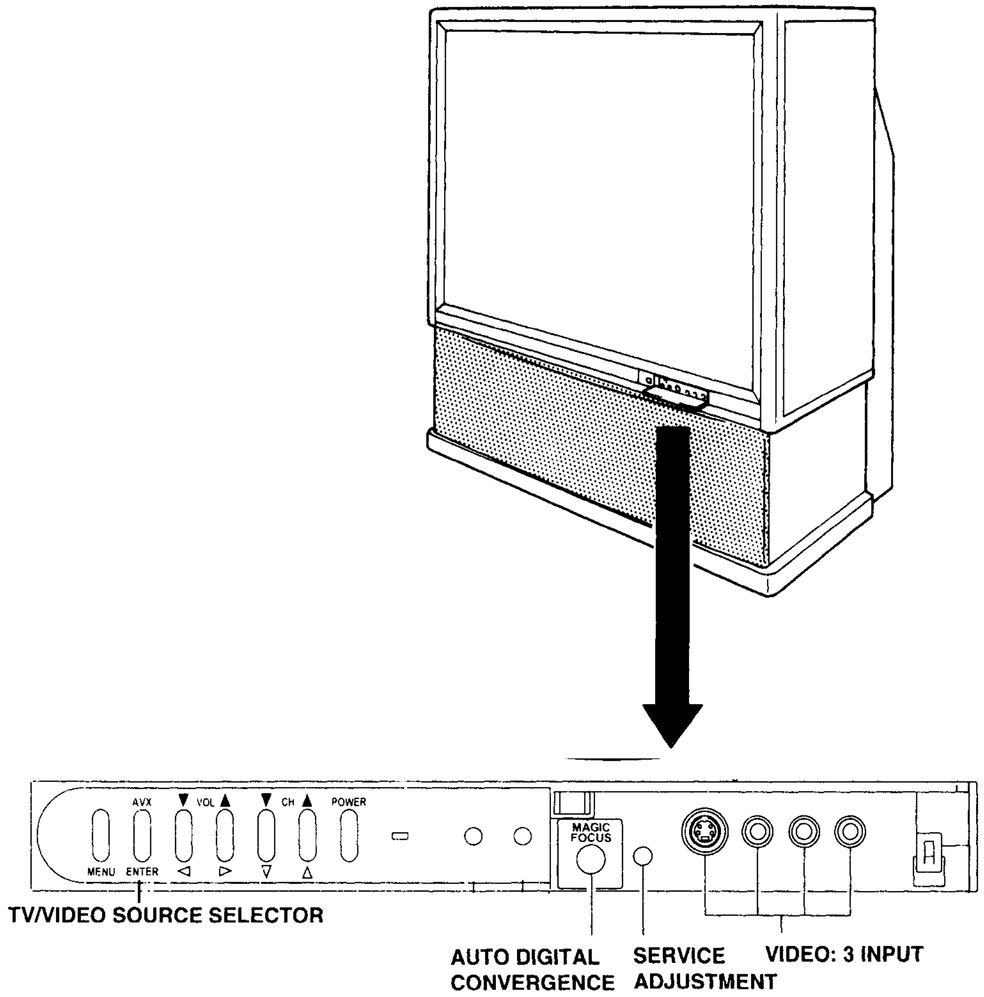
	60SX10BA/11KA	**50SX7PA**
Height (in.)	52-1/8	50-13/16
Width (in.)	60	43-1/4
Depth (in.)	22-11/16	21-5/8
Weight (in.)	391	250

Circuit Board Assemblies: CPT (B) P.C.B.
CPT (G) P.C.B.
CPT (R) P.C.B.
3 Line Comb. P.C.B.
Sensor Distribution P.C.B.
Signal P.C.B.
Deflection/Power Supply P.C.B.
Control P.C.B.
Surround P.C.B.
Surround Sub P.C.B.
Terminal P.C.B.
V.M. P.C.B.

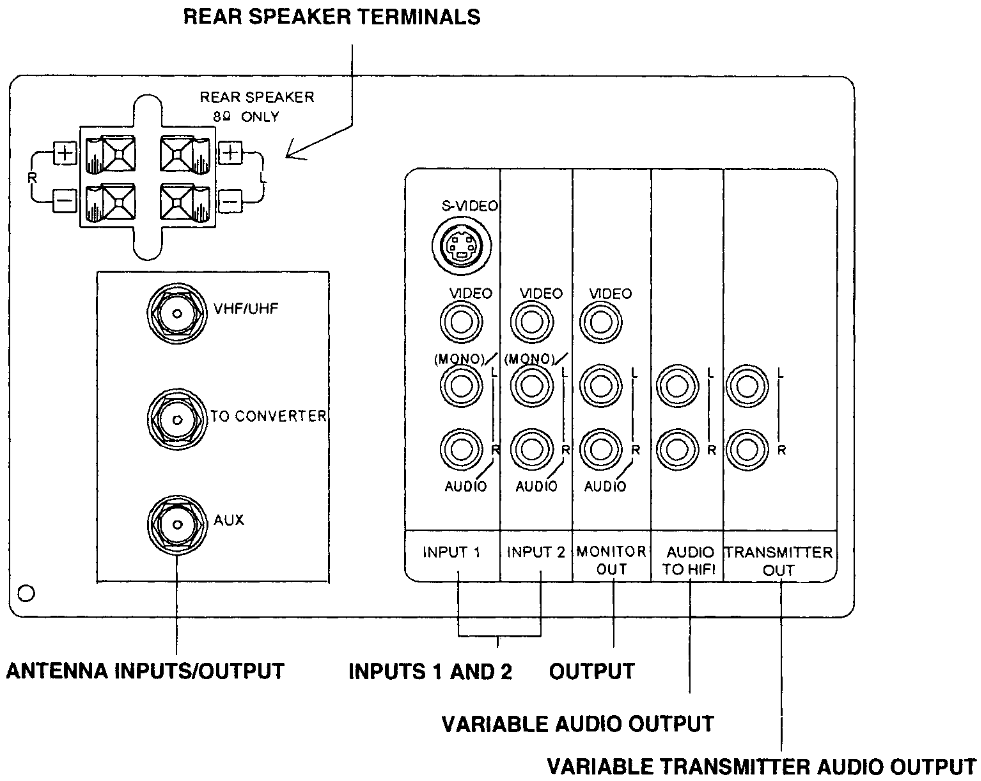
CIRCUIT PROTECTION

Fuse (or Device)	Circuit Protected	Physical Location
F902 5A/125V AC	Main Fuse	Power/Defl. Circuit Board
F903 5A/125V DC (MINIFUSE)	Main Fuse	Power/Defl. Circuit Board
F905 4A/125V DC (MINIFUSE)	26V Supply (Audio)	Power/Defl. Circuit Board
F906 1.6A/125V DC	115V (+B) Supply	Power/Defl. Circuit Board

GENERAL INFORMATION


AVX
VOL
CH
POWER
MENU
ENTER
MAGIC FOCUS
TV/VIDEO SOURCE SELECTOR
AUTO DIGITAL CONVERGENCE
SERVICE ADJUSTMENT
VIDEO: 3 INPUT

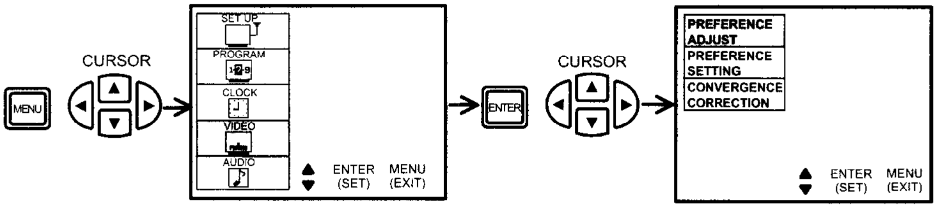
Control Panel
Fig. 3


REAR SPEAKER TERMINALS
REAR SPEAKER
8Ω ONLY
R
L
VHF/UHF
TO CONVERTER
AUX
S-VIDEO
VIDEO
VIDEO
VIDEO
(MONO)/
(MONO)/
L
R
AUDIO
AUDIO
AUDIO
INPUT 1
INPUT 2
MONITOR OUT
AUDIO TO HIFI
TRANSMITTER OUT
ANTENNA INPUTS/OUTPUT
INPUTS 1 AND 2
OUTPUT
VARIABLE AUDIO OUTPUT
VARIABLE TRANSMITTER AUDIO OUTPUT

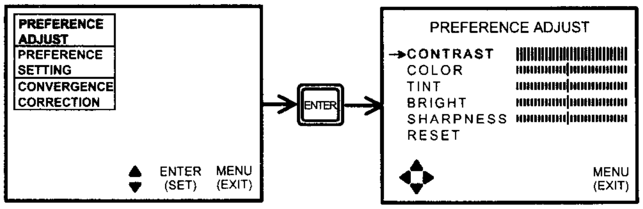
Rear Connections Panel
Fig. 4

ADJUSTING FOR PICTURE AND SOUND FUNCTIONS

VIDEO Select VIDEO to adjust picture settings, improve picture quality, and to adjust convergence.


MENU
CURSOR
SET UP
PROGRAM
CLOCK
VIDEO
AUDIO
ENTER (SET)
MENU (EXIT)
ENTER
CURSOR
PREFERENCE ADJUST
PREFERENCE SETTING
CONVERGENCE CORRECTION
ENTER (SET)
MENU (EXIT)

PREFERENCE ADJUST Use this feature to adjust contrast, color, tint, brightness, and sharpness.

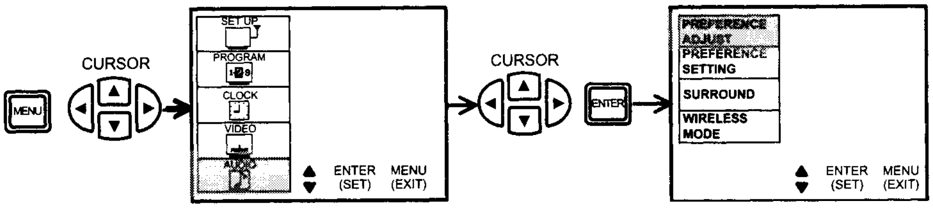

PREFERENCE ADJUST
PREFERENCE SETTING
CONVERGENCE CORRECTION
ENTER (SET)
MENU (EXIT)
ENTER
PREFERENCE ADJUST
CONTRAST
COLOR
TINT
BRIGHT
SHARPNESS
RESET
MENU (EXIT)

Press the CURSOR buttons to select and make adjustments.
The function to be adjusted will be in yellow.

CONTRAST —	Use this function to change the contrast between black and white level in the picture. This adjustment will only affect the picture when the PICTURE SETTING AI is OFF.
COLOR —	Use this function to adjust the level of color in the picture.
TINT —	Use this function to adjust flesh tones so they appear natural.
BRIGHT —	Use this function to adjust overall picture brightness.
SHARPNESS —	Use this function to adjust the amount of fine detail in the picture.
RESET —	When RESET is selected, press ENTER to return video adjustments to factory preset conditions.

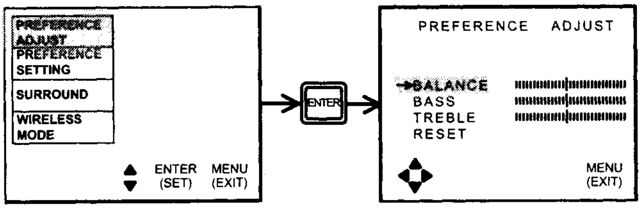
AUDIO

Select AUDIO to adjust the TV to your preference, to improve the sound quality, and to select special sound effects.


MENU
CURSOR
SET UP
PROGRAM
CLOCK
VIDEO
AUDIO
ENTER (SET)
MENU (EXIT)
CURSOR
ENTER
PREFERENCE ADJUST
PREFERENCE SETTING
SURROUND
WIRELESS MODE
ENTER (SET)
MENU (EXIT)

PREFERENCE ADJUSTMENT

Use this to set balance, bass, and treble.


PREFERENCE ADJUST
PREFERENCE SETTING
SURROUND
WIRELESS MODE
ENTER (SET)
MENU (EXIT)
ENTER
PREFERENCE ADJUST
BALANCE
BASS
TREBLE
RESET
MENU (EXIT)

Press the CURSOR buttons to select and make adjustments.
The function to be adjusted will be in yellow.

BALANCE — This function will control the left to right balance of the TV internal speakers, the AUDIO TO HI-FI output, and TRANSMITTER OUT output. (Use the test tone volume levels to control balance when in "Surround-Dolby Prologic" mode.)

BASS — This function controls the low frequency audio to all speakers.

TREBLE — This function controls the high frequency audio to all speakers.

RESET — When RESET is selected, press ENTER to return audio adjustments to factory preset conditions.

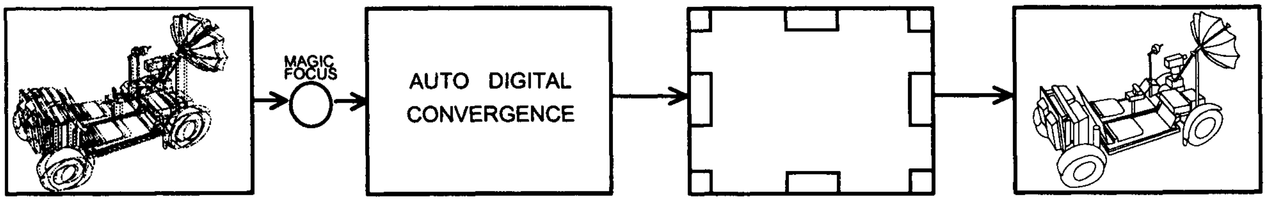
SELF CHECK REPAIR CODES

Press the AVX and POWER buttons on the control panel at the same time.

CODE	DETECTION CONTENTS	DETECTION TIME	REMARK
40	Abnormal deflection circuit	- - -	- - -
41	Abnormal + B line	- - -	- - -
42	Abnormal convergence circuit	- - -	- - -
10	Check for PLL lock	Not locked in 2 sec.	During selection time
11	Check for AFC operation	Not finished in 2 sec.	During selection time
60	Check for AC input	At uP reset time	AC input (50/60Hz) not detected at reset time
31	Check I001 operation	At uP reset time	Check for out of range operation
43	Abnormal signal circuit	- - -	- - -

Note: Code 10 or 11 may appear if TV is turned on without an antenna source connected.

Press the front panel MAGIC FOCUS button momentarily for auto setup.



To adjust manually, press and hold the MAGIC FOCUS button until CENTER MODE or STATIC MODE is displayed. Press ENTER on the remote to select red or blue. Green is stationary. Use the cursor buttons to adjust. Center mode only adjusts the center section. Static mode adjusts the entire screen. **Note:** This new data is in RAM memory only and will be lost if the MAGIC FOCUS button is pressed again.

CAUTIONS WHEN CONNECTING/DISCONNECTING THE HV CONNECTOR

Perform the following when the HV connector (anode connector) is removed or inserted for CPT replacement, etc.

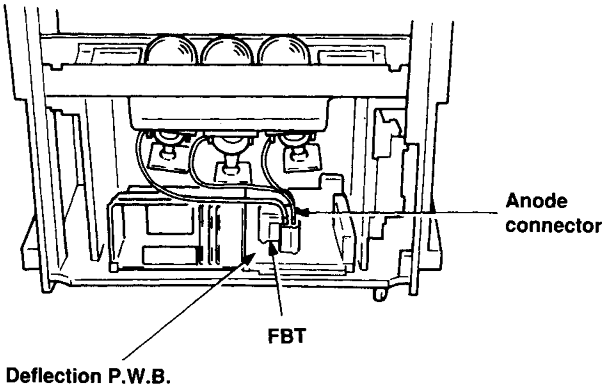

Anode connector
FBT
Deflection P.W.B.

Fig. 5

During Removal

1. Insert a small flat-bladed screwdriver (adjustment screwdriver: 5-7 mm wide and 0.2-0.3 mm thick) into section Ⓐ in Fig. 6 and then push it in the direction of arrow Ⓑ. The lock will release with a click. (The state in Fig. 8 (1) will change to that in Fig. 8 (2).)

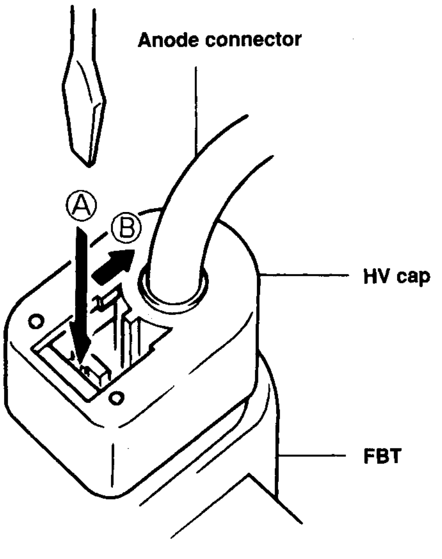

Anode connector
Ⓐ
Ⓑ
HV cap
FBT

Fig. 6

2. Remove the HV cap and remove the anode connector (Fig. 7).

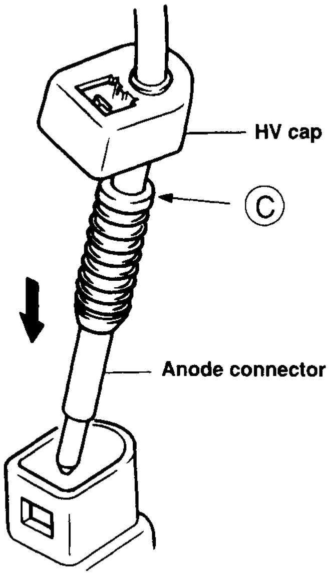
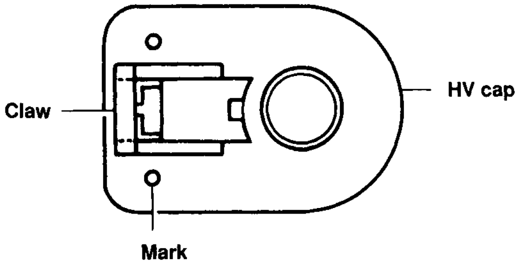

HV cap
Ⓒ
Anode connector

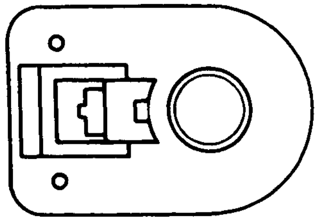
Fig. 7

During Insertion

1. Insert the anode connector deep into the FBT (to section Ⓒ in Fig. 7) and then push the HV cap into the FBT until it clicks.
2. Make sure the connector is securely inserted. (Check that the claw is at the mark on the HV cap shown as in Fig. 8 (1).)


Claw
HV cap
Mark

(1) Lock on
(When connector is inserted)



(2) Release
(When connector is removed)

Fig. 8

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1. ASSEMBLED P.W.B. ADJUSTMENT (Surround P.W.B.)

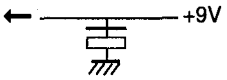
Note: This adjustment is only necessary when replacing the Surround P.W.B. Do not press INITIAL SET for an existing Surround P.W.B. or adjustment data will be lost. (Do not press ENTER)

Preparation for adjustment
MTS demodulating circuit adjustment

(1) Press the "POWER" button while pressing the "VOL DOWN" button to select "MTS ADJ" mode as shown.

MTS ADJUST		
➛ INITIAL SET	:	
INPUT LEVEL	:	20
ST VCO	:	20
FILTER	:	3F
SEPARATION (L)	:	20
SEPARATION (H)	:	20
SAP VCO	:	20

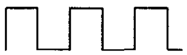
(2) Select the "INITIAL SET" to set each adjust data to initial data.
(3) Apply +9±0. 1V to the point as shown below.
  (1) SU 2 connector ⑬ pin
  (2) FRONTEND (U001) +B
  (3) SU 2 connector ⑭ pin GND



1.1 ST VCO adjustment

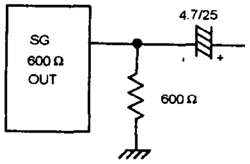
Adjustment preparation
(1) Select the "ST VCO" on "MTS ADJ" model
(2) Connect a frequency counter to SU1 connector ⑦ pin (IW01 ㉖ pin R-OUT).
Note: Use 1:1 probe
Probe standard Ri≥1MΩ, Ci≤15pF
(3) Input of SU1 connector ⑩ pin (IW01 ⑦ pin AUDIO in) is no signal.

Adjustment procedure
(1) Adjust the data Set to 15. 734±0. 1kHz of a frequency counter.
Note: Variable range of data: 00~3F (HEX).
Wave form of SU1 connector ⑦ pin (IW01 ㉖ pin R-OUT).



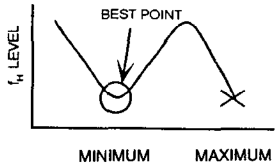
1.2 Filter adjustment

Adjustment preparation
(1) Select the "FILTER" on "MST ADJ" mode.
(2) Apply the signal to SU1 connector ⑩ pin (IW01 ⑦ pin AUDIO in) with the jig shown.



SU1 connector ⑩ pin
(IW01 ⑦ pin AUDIO-IN)

f=15. 734kHz (Sin wave)
v=100mVrms



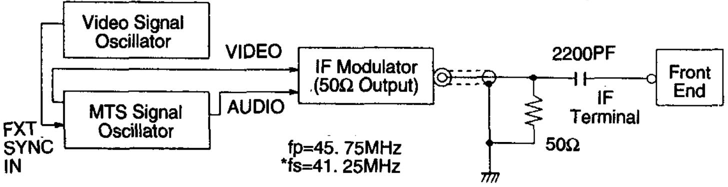
(3) Connect an oscilloscope to SU1 connector ⑦ pin (IW01 ㉖ pin R-OUT)

Adjustment procedure
(1) Adjust the data so that the wave form of SU1 connector ⑦ pin (IW01 ㉖ pin R-OUT) is minimum as shown above.
Note: Variable range of data: 00~3F (HEX)

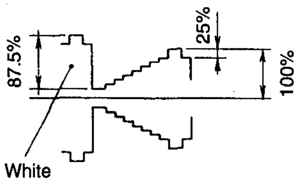
1.3 Input level adjustment

Adjustment preparation
(1) Select the "INPUT LEVEL" on "MTS ADJ" mode.
(2) Apply the signal to F/E IF input terminals of SIGNAL PWB using the jig shown.

Using the jig
*Video signal and audio signal should be synchronized.



IF modulator output signal waveform (Color bar or all white)



IF modulator output level and P/S
P=106dBu (50 ohm termination)
S level: -3dB to p
At this time, S/N ratio of F/E video output is 45dB or less.

Sound Modulation Condition
•Noise reduction encoder : ON
•Stereo signal : ① R=0 (L only), 300Hz, 30% modulation (note)
: ② R=0 (L only), 3KHz, 30% modulation (note)
•Monaural signal : ③ Monaural, 400Hz, 100% modulation (PRE-EN OFF)
•SAP signal : ④ SAP, 300Hz, 30% modulation (note)

Note 1: Use sound modulator with frequency characteristics within +1% during 50Hz~100KHz.
Note 2: Turn off noise reduction (NR), set 30% modulation, then turn (NR) on. Set modulation at audio signal generator output, not IF modulator output.

(3) Connect AC voltmeter to SU1 connector⑦ pin (IW01 ㉖ pin R-OUT)

Adjustment procedure
(1) Select sound input signal 3 and adjust the data set to 500±10mVrms of Vo.
Note: Variable range of data: 00~3F (HEX)

1.4 Separation adjustment

Adjustment preparation
(1) Connect an oscilloscope to SU1 connector (IW01 ㉖ pin R-OUT)
(2) Same as in item 1.3 (2).
(3) Set "MTS" to "STEREO".

Adjustment procedure
(1) Select the "SEPARATION (L)" on "MTS ADJ" mode.
(2) Select sound input signal ① and adjust the data so that 300Hz level is min.
Note: Variable range of data: 00~3F (HEX)
(3) Select the "SEPARATION (H)" ON "MTS ADJ" mode.
(4) Select sound input signal ② and adjust the data so that 3kHz level is min.
Note: Variable range of data: 00~3F (HEX)
(5) Repeat (1) and (4).
Note: •Adjustment precision: within + 1dB from min. point.
•"STEREO" should be displayed on the screen.
•Readjust INPUT LEVEL (1.3) as required.

1.5 SAP VCO adjustment

Adjustment preparation

(1) Select the "SAP VCO" mode.
(2) Connect a frequency counter to SU1 connector ⑦pin (IW01 ㉖ pin R-OUT).

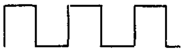
Note: •Use probe 1:1.
•Probe standard Ri≥1MΩ, Ci≤15pF.

(3) Input of SU1 connector ⑩pin (IW01⑦pin AUDIO in) is no signal.

Adjustment procedure

(1) Adjust the data set to read 78.67 ±0.5kHz on frequency counter.

Note: •Variable range of data: 00~3F (HEX)
•Wave form of SU1 connector⑦pin (IW01 ㉖ pin R-out).



1.6 SAP reception check

Adjustment preparation

(1) Same as in item 1.3 (2).
(2) Connect an oscilloscope to SU1 connector (IW01 ㉖ pin R-OUT).
(3) Set "MTS" to "SAP".

Adjustment procedure

(1) Select the audio input signal①. The output level at this time is represented by VST.
(2) Select the audio input signal ④. Check that the output level at this time is almost the same as VST. ("SAP" should be displayed at this time.)

2. CHASSIS ASSEMBLY ADJUSTMENT (SIGNAL BLOCK)

2.1 Memory initialization

Adjustment preparation

(1) Refer to section 4. ADJUSTMENT POINT to locate the 2-pin PI2 connector, on the signal PWB.

Adjustment procedure

(1) Short the pins for one second, then remove.
(2) A short "beep" will be heard at reset time, and channel "03" will be displayed on the OSD.

Note: The TV will be set to factory shipping conditions. Do not unplug set or press any buttons during this operation.

2.2 Comb filter adjustment

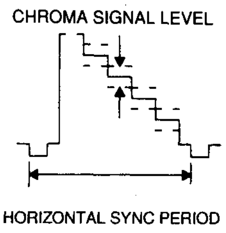
Adjustment preparation

(1) Receive the color bar signal at the regular tuning point.
(2) Connect the oscilloscope to the emitter of Q312.
(3) Set the brightness to Max (+31) and set the other controls to typ (0).
(4) Set the AI to OFF.

Adjustment procedure

(1) Check that the residual signal level is 50mVp-p or less.

Note: The chroma signal level is the point shown below.



Note: •Use a 10:1 probe.
•Use an oscilloscope with a 20mV/div resolution.

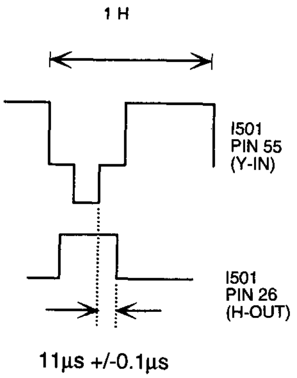
2.3 Horizontal coarse AFC adjustment (R367)

Adjustment preparation

(1) Receive the reverse cross-hatch pattern signal. (Cross-hatch lines are black.)
(2) Connect the oscilloscope to I501 pin (55) (Y-in) and pin ㉖ (Horizontal pulse out).

Adjustment procedure

(1) Adjust R367 (AFC) for 10µs delay between pin (55) and ㉖.



3. FINAL ASSEMBLY ADJUSTMENT

3.1 Optical system adjustment

3.1.1. Focus adjustment

Adjustment preparation

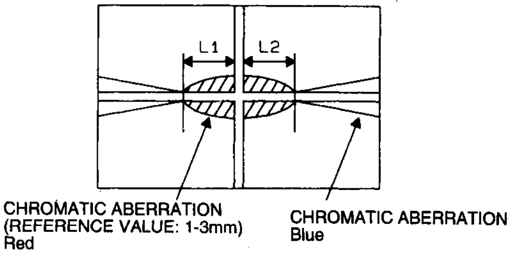
(1) The set can face in any direction, west, east, north or south.
(2) Receive the cross-hatch pattern signal.
CONTRAST: CENTER
BRIGHTNESS: -16 (-8 position shown on display)
(3) The electrical focus adjustment should have been completed.
(4) The centering DY inclination should have been adjusted.

Adjustment procedure

(1) Loosen the fixing screw on the lens cylinder so that the lens cylinder can be turned. (Be careful not to loosen too much. If it is loosened too much, rattling when tightening becomes greater and the focus may drift.) After completing steps (5), (6) and (7) below, tighten the fixing screws for each lens with a torque of 7-12kg/cm.
(2) Apply covers to 2 of R, G and B lenses, and project a single color on the screen and adjust in sequence. (The adjustment order of R, G and B is only an example.)
(3) For each of the R, G and B lenses, observe the color aberration generated on the outer circumference of the cross-hatch bright line at the center section ± pitches vertically and horizontally from the center.
(4) If the lens adjustment knob is turned clockwise, viewed from the front, the color aberration changes as follows.

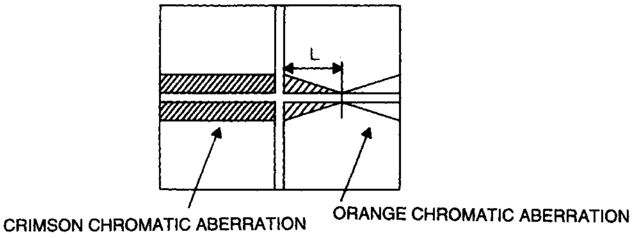
Lens	Change of color aberration
R lens	Orange → Crimson
G lens	Blue → Red
B lens	Purple → Green

(5) In case of G lens, set to the point where the chromatic aberration switches from blue to red. If the chromatic aberration appearing all over the screen is not the same, observe the horizontal bright line at the center of the screen and set to the position where red chromatic aberration slightly appears (reference value: 1-3mm) within the cross-hatch pitches specified in Table below. When the red chromatic aberration appearing at both sides of the bright line is not equal, observe the side with larger chromatic aberration when adjusting.



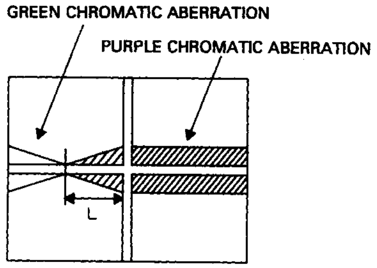
Set Size	Pitch between L1 & L2
46"	4.0 cross-hatch pitches
50"	4.0 cross-hatch pitches
60"	4.0 cross-hatch pitches

(6) In case of R lens, set to the position where the chromatic aberration changes from orange to crimson.
As shown below, observe the horizontal bright line at the center and set to the position where the crimson chromatic aberration slightly appears (reference value: 1-3mm) within the cross-hatch pitches specified in Table below. Change the signal and fine-adjust in the same way as the G lens.

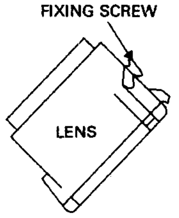


Set Size	Pitch between L
46"	5.0 cross-hatch pitches
50"	5.0 cross-hatch pitches
60"	5.0 cross-hatch pitches

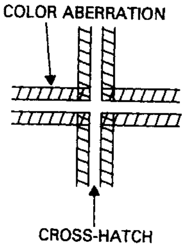
(7) In case of B lens, set to the position where the chromatic aberration changes from purple to green.



Notes: (1) Fixing screw



(2) Color aberration



(3) Since the G light is very important for picture quality and performance, pay special attention in its adjustment.
Note: Be careful not to touch the lens with your fingers when adjusting.
(4) For red, setting to the center between orange and crimson is optimum.
(5) For blue, setting to the center between purple and green is optimum.

3.2 Signal system adjustment

3.2.1. White balance adjustment

(1) Screen adjustment
(2) High brightness white balance
(3) Low brightness white balance

Screen adjustment VRs	Drive adjustment VRs
Red: R804R	Red: R874
Green: R804G	Green: R843
Blue: R804B	

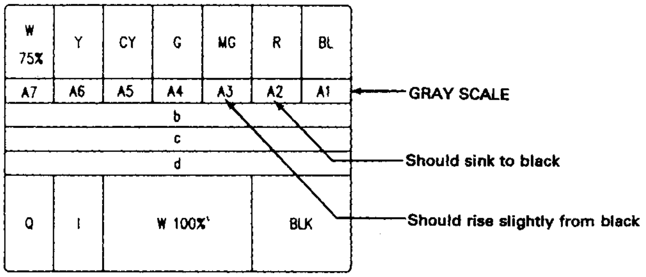
Adjustment preparation
(1) Start adjustment 20 minutes or more after the power is turned on.
(2) The vertical incident illumination on the screen should be 20 lux or less.
(3) Receive the white raster.
(4) Set the drive adjustment VRs (red and green) to their mechanical centers.
(5) Turn the screen adjustment VRs (red, green, blue) fully counter-clockwise.
(6) Set video preference setting white control to warm position.
(7) Set the S301 switch to the front as viewed from the front of the signal P.W.B. (Set to SERVICE side.)

Adjustment procedure
(1) Gradually turn the screen adjustment VRs (red, green, blue) clockwise and set them where the red, green and blue slightly bright lines just appear evenly on the screen.
(2) Return S301 to the NORMAL side.
(3) Set the brightness and black level controls to minimum and turn the sub brightness adjustment VR (R325) and set so that the white raster can be seen slightly.
(4) Set the brightness and black level controls to maximum.
(5) Adjust the high brightless white balance using the drive adjustment VRs (red, green).
(6) Set the brightness to 3ft-L amount or less using the brightness and black level controls.
(7) Adjust the low brightness white balance using the screen adjustment VRs (red, green, blue). (Visually adjust.)
(8) Check that high brightness white balance is obtained.
If it does not, return to step (5).

Note: When adjusting the white balance, if the horizontal single raster is to be obtained using S301, check that the screen adjustment VRs are turned fully counterclockwise. Since the phosphorescent surface of the CRT is likely to be burnt, be careful.
White balance: 7500ºK+0MPCD
Color coordinate: X.....0.301
Y.....0.310

3.2.2. Sub brightness adjustment (R325)

Adjustment preparation
(1) Start adjustment 20 minutes or more after the power is turned on. Receive the color bar signal.
(2) Set the contrast and color controls to minimum.
(3) Set the brightness to -6 (-3 position shown on the display).
(4) The vertical incident illumination on the screen should be 20 lux or less.



Adjustment procedure
(1) Adjust so that the points A1 and A2 sink to black and A3 slightly above it rises using the sub brightness adjustment VR (R325).

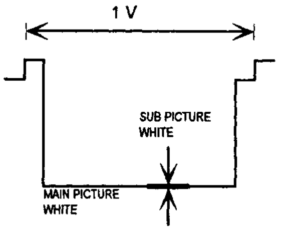
3.2.3. Sub picture adjustment (R506-B, R505-G, R502-R)

Adjustment preparation

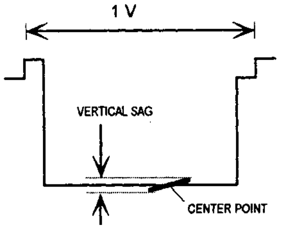
1. Start adjustment after power is on for 20 minutes.
2. Use a white raster signal for adjustment.
3. Press "FREEZE" on the remote control to display the sub picture.
4. Set contrast to center, brightness minimum, AI off.

Adjustment procedure

1. Connect oscilloscope to TP802B and adjust R506 to match blue level of main and sub pictures.
2. Repeat for TP802G and R505 green, TP802R and R502 for red.



Note: If the sub picture has a signal sag, adjust level at center point.



3.2.4. Surround operation check

Adjustment preparation

Input the following audio signals to the audio input of the VIDEO INPUT terminals.

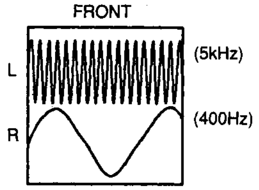
- When checking surround:
  L CH: 400Hz sine wave 475mVrms
  R CH: 5kHz sine wave 475mVrms
- Set the AUDIO PREFERENCE SETTING for INT. SPEAKERS ON.
- Set the volume controls of FRONT, CENTER and REAR to around their centers.
- Set the BASS, TREBLE and BALANCE to TYP.

Note: Front waveform: Front speaker output of the set
Rear waveform: Rear speaker output of the set

3.2.4.1. Surround off check

Adjustment procedure

(1) Set to SURROUND: OFF and check that the waveform shown below is obtained.

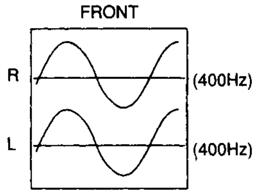


Note: The rear and center will have no output.

3.2.4.2. Surround off/monaural check

Adjustment procedure

Check that the following waveform is obtained. The amplitudes of 2 channels are equal.



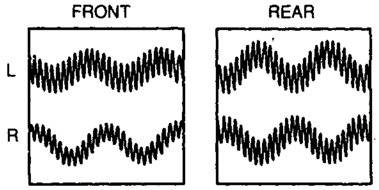
Note: Monaural check can be omitted. The rear and center have no output.

3.2.4.3. Matrix surround check

Adjustment procedure

(1) Set to SURROUND; MATRIX.

- Check that the following waveforms are obtained.
- Front: Check that the phases of R and L are different and 400Hz is superimposed on 5kHz. The amplitudes of R and L are different.
- Rear: Check that the phases of R and L are opposite and 400Hz is superimposed on 5kHz. The amplitudes of R and L are different.



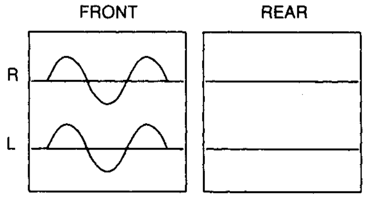
Note: Center has no output.

3.2.4.4. Matrix surround/monaural check

Adjustment procedure

Check that the following waveforms are obtained.

- Front: R and L waveforms are almost equal.
- Rear: R and L waveforms are almost zero.



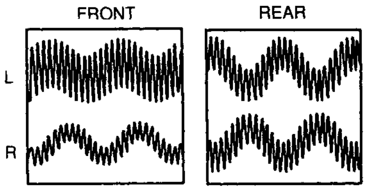
Note: Center has no output.

3.2.4.5. Hall surround check

Adjustment procedure

(1) Set to SURROUND: HALL.

- Front: Check that the phases of R and L signals are different and 400Hz is superimposed on 5kHz.
- Rear: Check that the R and L are opposite and 400Hz is superimposed on 5kHz. The R and L amplitudes are equal.



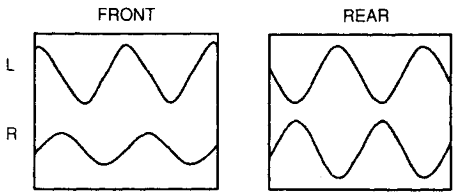
Note: Amplitude levels of front R and L are not even depending on the P.W.B. Center has no output.

3.2.4.6. Hall surround/monaural check

Adjustment procedure

Check that the following waveforms are obtained.

- Front: The phases of R and L are different.
  The amplitudes are different.
- Rear: The phases of R and L are opposite.
  The amplitudes of R and L are equal.



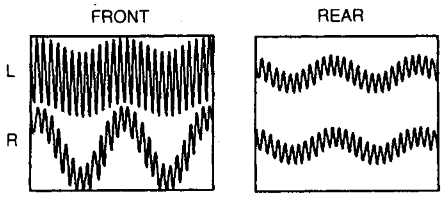
Note: The monaural check can be omitted. Amplitude levels of front R and L are not even depending on the P.W.B. Center has no output.

3.2.4.7. Dolby surround check

Adjustment procedure

(1) Set to SURROUND: DOLBY

- Check that the following waveforms are obtained.
- Front: 400Hz is superimposed on 5kHz.
- Rear: R and L are the same signal and 400Hz is superimposed on 5kHz.



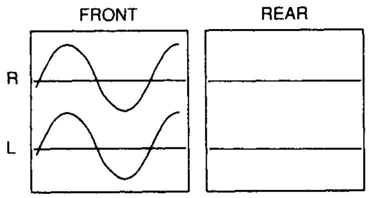
Note: MODE: PRO-LOGIC
CENTER: NORMAL
Set as above.

3.2.4.8. Dolby surround/monaural check

Adjustment procedure

Check that the following waveforms are obtained.

- Front: R and L waveforms are the same signal.
- Rear: (Almost no output from both R and L.)



Note: Front side check can be omitted.

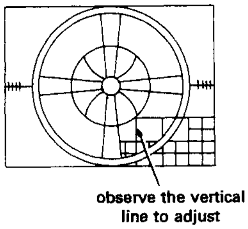
3.2.5. Shoot balance adjustment (R333)

Adjustment preparation

(1) Receive the reverse cross-hatch pattern signal. (Cross-hatch lines are black.)
(2) Set the video condition to factory reset.
(3) Turn the shoot balance adjustment VR (R333) fully counter-clockwise.

Adjustment procedure

Gradually turn the shoot balance adjustment VR (R333) clockwise and adjust so that the width of pre-shoot and over-shoot of the vertical line (black) shown in the circle pattern are balanced. (Visually adjust.)



Note: Directly observe the screen by eye without using a mirror.

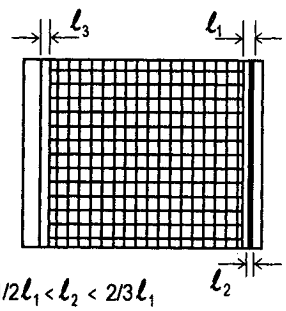
3.2.6. Horizontal AFC adjustment (R367)

Adjustment preparation

(1) Receive the reverse cross-hatch pattern signal. (Cross-hatch lines are black.)
(2) Set CONTRAST to maximum BRIGHTNESS to center.
(3) Lens focus should be completed.
(4) Electrical focus should be coarse adjusted.
(5) The digital convergence RAM should be cleared (uncorrected state). With the TV set off, press and hold the service switch located on the front panel (see page 11), and then press the power button. Use a small insulated tool to reach inside the control panel to press the switch.
(6) Raster inclination should be completed.

Adjustment procedure

(1) Project only green color. Cover R & B lenses or short 2P mini connectors on CPT P.W.B.'s.
(2) Adjust H-size to minimum. R649 fully counterclockwise.
(3) Adjust green centering magnet (located on DY) to shift picture left to display edge of raster.
(4) Adjust AFC (R367) so foldover of front porch occurs. Amount of foldover is 1/2 to 2/3 of front porch (ℓ_1).



$1/2\ell_1 < \ell_2 < 2/3\ell_1$

$\ell_1 = \ell_3$

Note: (1) Front and back porch of video should be equal.
(2) If adjustment is difficult with test pattern, follow adjustment 2.3.

3.3.DEFLECTION SYSTEM ADJUSTMENT

3.3.1. Raster inclination adjustment (Deflection yoke)

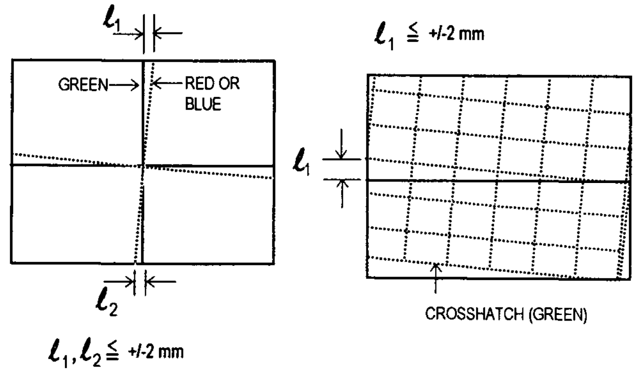
Adjustment preparation

(1) The set can face east or west.
(2) Input the single cross test signal.
(3) CONTRAST: MAX
BRIGHTNESS: CENTER
(4) The lens focus adjustment should have been completed.
(5) The electric focus should have been coarse adjusted.
(6) The digital convergence RAM should be cleared (uncorrected state). With the TV set off, press and hold the service switch located on the front panel (see page 11), and then press the power button. Use a small insulated tool to reach inside the control panel to press the switch.
(7) Start adjustment 20 minutes or more after TV is turned on.

Adjustment procedure

(1) Apply covers to the R and B lenses and project only green light.
(2) Turn the G deflection yoke and adjust the vertical raster inclination.

(3) Then, remove the cover of R or B lens and project red or blue light and green light together on the screen.
(4) Turn the deflection yoke of R or B and set so that the inclination of R or B with respect to the green light is as shown below on the top and bottom sides.
(5) After raster inclination adjustment, fixing screw of DY should be screwed with 12±2 kg•cm torque.



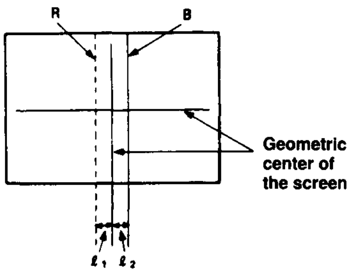
Notes: (1) If internal cross-hatch does not appear after clearing RAM data, press front panel service switch (see page 11) again.
(2) To restore old RAM data, turn TV off and on.

3.3.2. Raster position adjustment

Adjustment preparation
(1) The set can face east or west.
(2) Input the single cross test signal.
(3) CONTRAST: MAX
BRIGHTNESS: CENTER
(4) The lens focus adjustment should have been completed.
(5) The electric focus should have been coarse adjusted.
(6) The digital convergence RAM should be cleared (uncorrected state). With the TV set off, press and hold the service switch located on the front panel (see page 11), and then press the power button. Use a small insulated tool to reach inside the control panel to press the switch.
(7) Start adjustment 20 minutes or more after TV is turned on.

Adjustment procedure
(1) Turn the centering magnets for red and blue to satisfy the condition below. The horizontal lines should match with green.

Size	Vert. Line	Side of Green
60"	Red l_1	0mm left
60"	Blue l_2	40mm right
50"	Red l_1	7mm left
50"	Blue l_2	42mm right
46"	Red l_1	7mm left
46"	Blue l_2	42mm right



Notes: (1) If internal cross-hatch does not appear after clearing RAM data, press front panel service switch (see page 11) again.
(2) To restore old RAM data, turn TV off and on.

3.3.3. Size adjustment

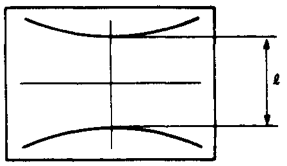
3.3.3.1. Vertical size adjustment (R612)

Adjustment preparation
(1) The set can face east or west.
(2) Input the single cross test signal.
(3) CONTRAST: MAX
BRIGHTNESS: CENTER
(4) The lens focus adjustment should have been completed.
(5) The electric focus should have been coarse adjusted.
(6) The digital convergence RAM should be cleared (uncorrected state). With the TV set off, press and hold the service switch located on the front panel (see page 11), and then press the power button. Use a small insulated tool to reach inside the control panel to press the switch.
(7) Start adjustment 20 minutes or more after TV is turned on.

Adjustment procedure
(1) Turn only the green by applying covers to the red and blue lens or shorting the 2 pin TS connectors on the red and blue CPT P.W.B.
(2) Turn vertical amplitude adjustment VR (R612) so that the distance between the top and bottom horizontal lines is equal to the size shown in the table.

Size	l
60"	770 ± 5mm
50"	650 ± 5mm
46"	600 ± 5mm

Note: (1) If internal cross-hatch does not appear after clearning RAM data, press front panel service switch (see page 11) again.
(2) To restore old RAM data, turn TV off and on.

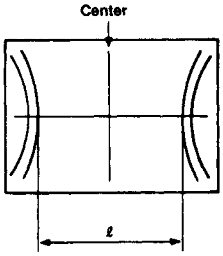


3.3.3.2. Horizontal adjustment (R649)

Adjustment preparation
(1) The set can face east or west.
(2) Input the single cross test signal.
(3) CONTRAST: MAX
BRIGHTNESS: CENTER
(4) The lens focus adjustment should have been completed.
(5) The electric focus should have been coarse adjusted.
(6) The digital convergence RAM should be cleared (uncorrected state). With the TV set off, press and hold the service switch located on the front panel (see page 11), and then press the power button. Use a small insulated tool to reach inside the control panel to press the switch.
(7) Start adjustment 20 minutes or more after TV is turned on.

Adjustment procedure
(1) Project only green, the same as 3.3.3.1.
(2) Turn horizontal amplitude adjustment VR (R635) so second vertical line from left and second vertical line from right is equal to the size shown in the table.

Size	l
60"	1140 ± 5mm
50"	950 ± 5mm
46"	875 ± 5mm



Note: (1) If internal cross-hatch does not appear after clearing RAM data, press front panel service switch (see page 11) again.
(2) To restore old RAM data, turn TV off and on.

3.3.4 Focus adjustment

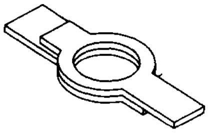
3.3.4.1. Beam alignment

Adjustment preparation

1. Adjust at least 30 minutes after turning on power switch.
2. The static convergence data should be cleared (see section 2.1 Memory initialization).
3. Raster inclination, centering, horizontal and vertical amplitudes and optical focus adjustment should be completed.
4. Contrast: Max.
   Other items: Typ.
5. Receive cross-hatch signals. (Use of internal cross-hatch signals allowed.)
6. Short-circuit all metal parts (metal fittings, centering magnet) installed on the projection tubes to GNDs of the projection tubes.
   Since metal parts are charged with electricity, shocks may be caused if they are not short-circuited.

Adjustment procedure

1. Green (G) tube beam alignment adjustment. Short-circuit 2P subminiature connector plug pins of Red (R) and Blue (B) on the CPT boards and project only Green (G) tube.
2. Put Green (G) tube beam alignment magnet to the cancel state as shown below.



3. Turn the Green (G) static focus (Focus Pack) counterclockwise all the way and make sure of position of cross-hatch center on screen. (Halo state.)
4. Turn Green (G) static focus (Focus Pack) clockwise all the way. (Blooming state.)
5. Turn two magnets forming alignment magnet in any desired direction and move cross-hatch center to position found in (3).
6. If image position does not shift when Green (G) static focus (Focus Pack) is turned, Green (G) beam alignment has been completed.
7. If image position shifts when Green (G) statis focus (Focus Pack) is turned, repeat (2)-(6).
8. Conduct beam alignment for Red (R) focus: Focus Pack EFPK
   Blue (B) focus: Focus Pack EFPK
9. Upon completion of adjustment, fix beam alignment magnets with white paint.

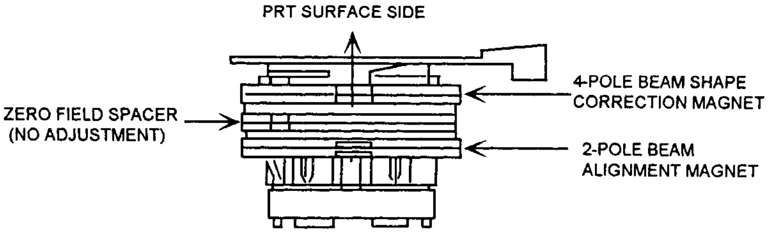
3.3.4.2. Beam shape adjustment

Adjustment preparation

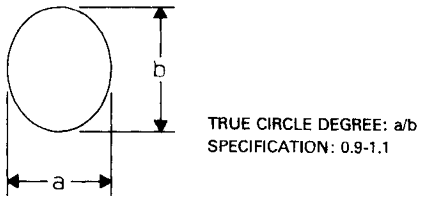
1. The beam alignment should have been completed.
2. The raster inclination, centering, horizontal/vertical amplitude and optical focus adjustments should have been completed.
3. Contrast: Max
   Other time: Typ.
4. Input the dot signal.

Adjustment procedure

1. Green PRT beam shape adjustment. Short-circuit 2P submini connectors on Red and Blue CPT P.W.B.s to project only the Green beam.
2. Turn the green static focus fully clockwise. (Blooming.)
3. Make the dot at the screen center a true circle using the 4-pole magnet as shown below.
4. Also adjust the Red and Blue PRT beam shapes according to the steps (1) to (3).
5. After the adjustment is completed, return R, G and B static VRs to the Just focus point.


PRT SURFACE SIDE
4-POLE BEAM SHAPE CORRECTION MAGNET
ZERO FIELD SPACER (NO ADJUSTMENT)
2-POLE BEAM ALIGNMENT MAGNET

TRUE CIRCLE SPECIFICATION



3.3.4.3. Static focus adjustment

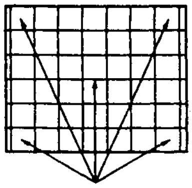
Adjustment preparation

1. The raster inclination, centering, horizontal/vertical amplitude and optical/electrical focus beam alignment should have been adjusted.
2. The static convergence data should be cleared.
3. Contrast: More than MAX-5 STEP
   Brightness: Center (Reset point)
4. Receive the cross-hatch pattern signal.
5. Apply covers to the lenses of colors other than the color to be adjusted and project a single color.

Adjustment procedure

1. Red (R), Green (G) and Blue (B) static focus adjustment. Vary the static focus VR (focus pack EFPK) and make the center of the cross-hatch pattern clearest.
2. Observe the corners of the picture and check that the focus does not get conspicuously worse.

OBSERVING POINTS OF THE CORNER OF THE PICTURE



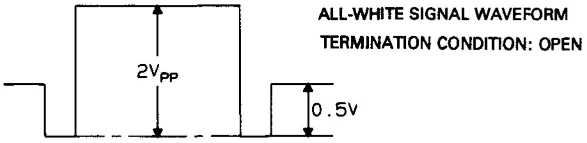
3.3.5. Blue defocus adjustment

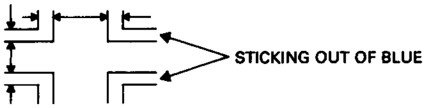
Adjustment preparation

1. Optical and electrical focus adjustment should have been completed.
2. The convergence adjustment should have been completed. Coarse-adjustment is acceptable for convergence.
3. Brightness: Max.
   Other items: Typ.

Adjustment procedure

(1) Input an all-white signal shown below to VIDEO input.
(2) Short-circuit 2P sub-mini connectors on the red and green CPT P.W.B.s to display only the blue beam.
(3) Turn the B static (Focus Pack) fully clockwise.
(4) Measure the brightness at the center of the screen and turn the B static (Focus Pack) counterclockwise to adjust the brightness of blue as shown in Table below.
(5) After the adjustment is completed, if blue exceeds the specification, turn and adjust focus so that the sticking out part of blue satisfies the specification.





UNEVENNESS SPECIFICATION: ±1cd/m²

Defocus brightness specification

Screen Size	Brightness of Blue
46"	45 cd/m²
50"	38 cd/m²
60"	--

Defocus sticking out specification

Screen Size	Blue sticking out
46"	2.0 mm
50"	2.0 mm
60"	2.5mm

Condition: User controls are set to the initial set positions (for shipment) Measuring point Screen center.

Cautions: Correct the brightness gauge and amplitude of the all-white signal periodically. The aperture angle of the brightness gauge is 1°.
Use a cross-hatch pattern to check.

3.4. CONVERGENCE ADJUSTMENT

3.4.1. Static convergence adjustment

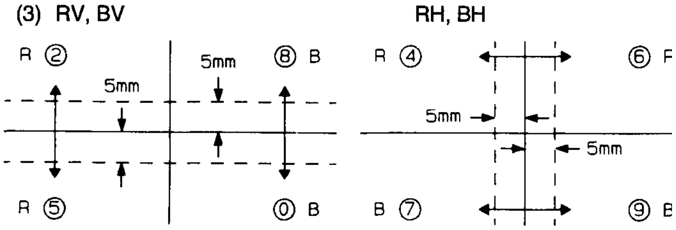
Adjustment preparation

(1) The screen can face east or west.
(2) Display the cross pattern signal or the cross-hatch pattern signal.
(3) R, G and B lens focus adjustment and R, G and B raster inclination adjustment should have been completed.
(4) The following adjustment for G raster should have been completed.
(5) R and B raster position (centering magnet) adjustment should have been completed.
(6) The dynamic convergence should have been coarse adjusted previously.

Adjustment procedure

(1) Press front panel MAGIC FOCUS button until "STATIC MODE" appears.
(2) Check that the variable range of the static convergence adjustment is obtained as shown below using the cursor

(3)



If the adjustment cannot be done, turn the centering magnets for R and B and re-adjust the R and B raster position.

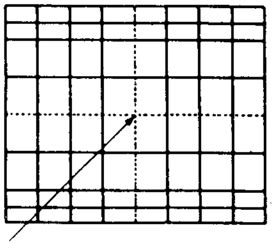
Note: (1) Static convergence is set to standard mode during memory initialization.

3.4.2. Digital convergence adjustment

Note: If replacing a PRT, DY, etc. perform auto-digital convergence first. (Press front panel MAGIC FOCUS switch when in normal customer mode). This can eliminate the need for a complete digital convergence alignment.

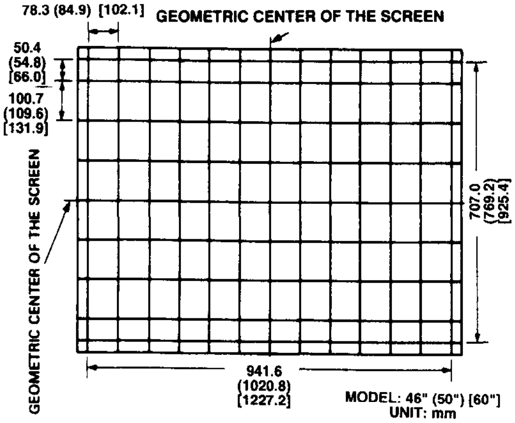
Adjustment preparation

(1) Receive an RF or video signal.
(2) Set controls to factory preset.
(3) Install jig screen on the set.
(4) Note the center of the video pattern displayed. This is necessary to match dotted lines (adjustment point viewed) and actual point that is adjusted and displayed by the video signal.
(5) Press the front panel service only switch. (See page 11). The pattern displayed is now the digital convergence mode (Fig. 3-4-3).
(6) When performing a complete digital convergence adjustment CLEAR DATA in RAM. See 3.3.1. (1)-(7).



Adjustment point

JIG SCREEN SPECIFICATION



Notes: (1) Jig screen part number:
46" - H310353
50" - H310354
60" - H310355

(2) If only minor adjustments to convergence are needed, the jig screen is not necessary. Use digital data stored in memory and one color as a reference (red, green, or blue). DO NOT CLEAR DATA and WRITE to ROM

3.4.2.1. Phase adjustment (service mode)

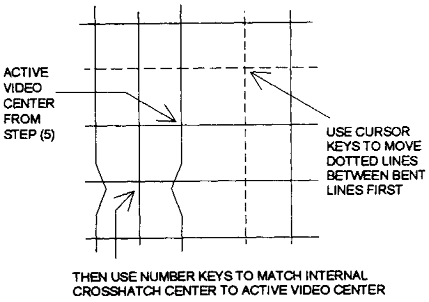
Adjustment preparation

(1) PHASE adjustment — This is to match the digital convergence cursor position to the video image displayed, and to match the digital convergence cursor position (dotted lines) to digital convergence data position (bent lines).

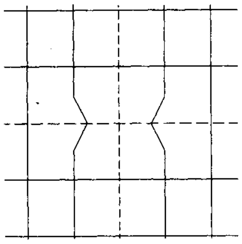
Adjustment procedure

(1) Press the SRD button on the remote to select phase adjustment. (Only Green displayed)
(2) Identify the bent lines and use the cursor buttons to move the dotted lines in between as shown.
(3) Press SRD to exit PHASE mode.
(4) Press ENTER 5 times to display external signal.
(5) Identify center of active video, then press ENTER 5 times to return to internal cross-hatch.
(6) Press SRD (phase adj.), and use 2, 4, 5 and 6 to position internal cross-hatch center on active video center identified in step (5).
(7) Press SRD to exit PHASE mode.

BEFORE


ACTIVE VIDEO CENTER FROM STEP (5)
USE CURSOR KEYS TO MOVE DOTTED LINES BETWEEN BENT LINES FIRST
THEN USE NUMBER KEYS TO MATCH INTERNAL CROSSHATCH CENTER TO ACTIVE VIDEO CENTER

AFTER



3.4.2.2. Raster position adjustment

Adjustment preparation

(1) Position adjustment — This will move an entire color. Use this adjustment to match colors at the center of the screen. (Active video center from external signal and physical screen center should now match from phase adj. 3.4.2.1.).
(2) Use the buttons below to switch color to adjust.
"RECALL" - Green
"O" - Red
"AVX" - Blue

Adjustment procedure

(1) Press the FREEZE button. Extra horizontal lines appear to confirm raster position mode.
(2) Use the cursor buttons to adjust position.
(3) Press FREEZE again to exit raster position mode.

Notes: (1) Other functions cannot be accessed when in raster position adjustment mode. Press FREEZE and confirm extra horizontal lines disappear to exit raster position mode.
(2) Press MENU to switch between all colors displayed or adjustment color and Green only.

3.4.2.3. Convergence point adjustment

Adjustment preparation

(1) Select color to adjust.
"RECALL" - Green
"O" - Red
"AVX" - Blue
(2) Use 4, 6, 2, and 5 to move the cursor position (dotted lines).
(3) Use cursor buttons to move the convergence point.
(4) Three adjustment modes are available:
1. (3x3) Press "RECALL" 5 times
2. (7x5) Press "O" 5 times
3. (13x9) Press "AVX" 5 times

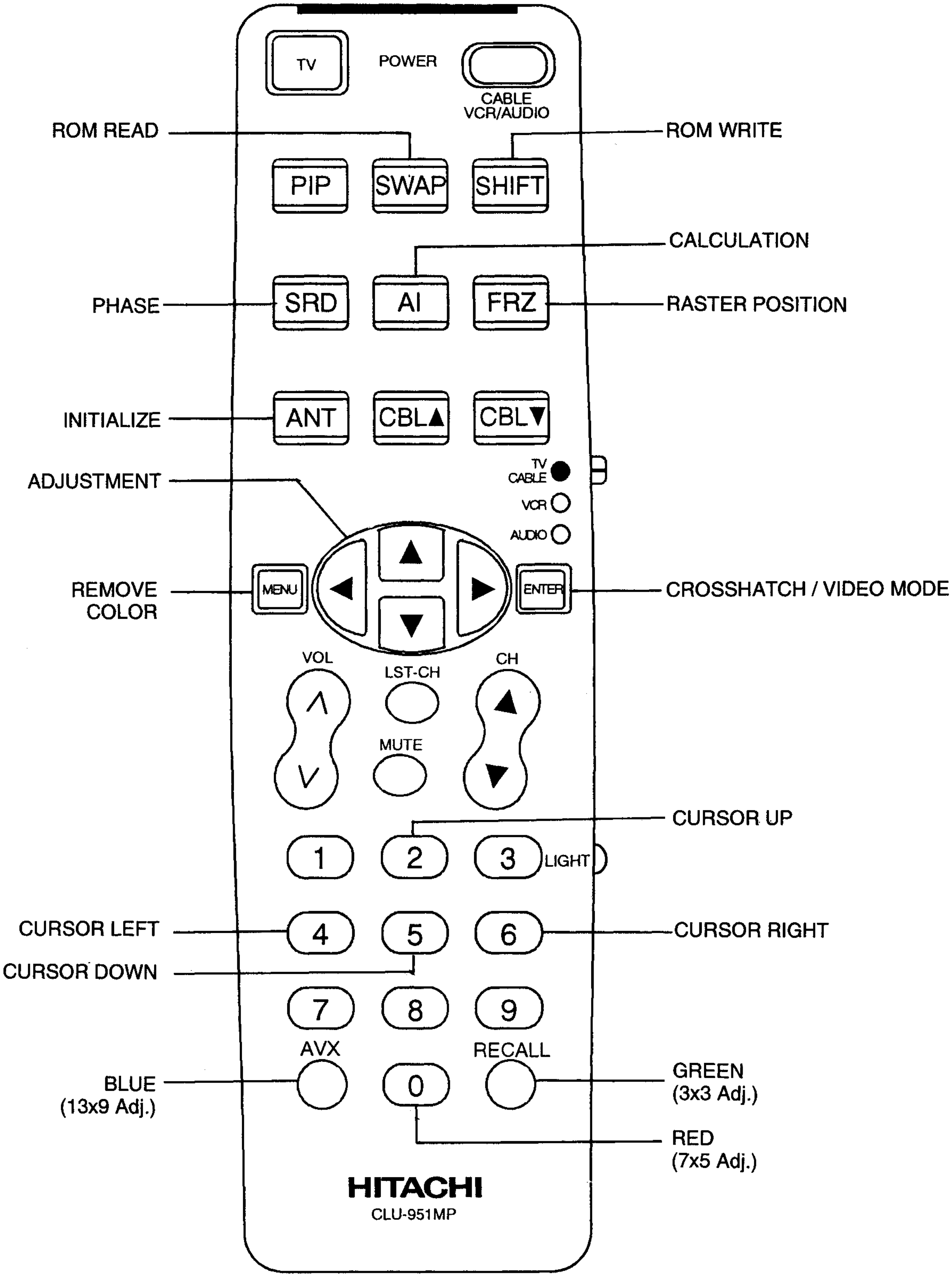
For touch-up, only the (13x9) mode is necessary. This will adjust every cross-hatch intersection point on the screen.
For complete adjustment, start with (3x3) mode. This will adjust center point and eight edge points only, but will greatly reduce adjustment time. Then use (7x5) mode, and finally (13x9) mode to finish convergence.
If "S" distortion appears between cross-hatch lines repeat (7x5) mode to change calculation process while adjusting to remove distortion, then return to (13x9) mode to finish touch-up convergence.

Adjustment procedure

(1) Start adjustment at the center of the screen.
(2) Continue adjustment at next closest position.
(3) Adjust center area first, and ending with edge sections.
(4) Press the AI button to perform interpolation operation. This process will take about 15 seconds and no picture will be seen at this time.
(5) After interpolation, check convergence again and repeat (1)-(5) if necessary.
(6) When convergence is acceptable, press SHIFT to write data to ROM memory. ROM WRITE? is displayed to alarm system that ROM will be overwritten with new data. Press the SHIFT button again to write displayed data to ROM.
(7) DATA WRITE TO ROM will take approximately 20 seconds and no picture will be displayed.
(8) Green dots will be displayed when operation is complete.
(9) Press MUTE to return to convergence pattern, then confirm again convergence is acceptable.
(10) Press SHIFT (ROM WRITE) mode, then press ANT to initialize sensor data positions.

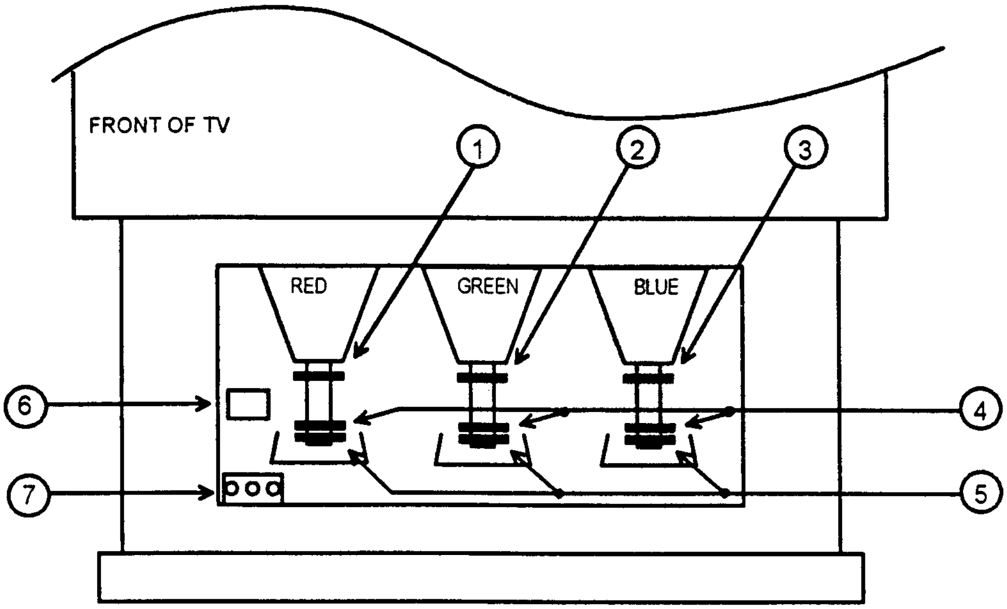
Notes: (1) Display only green for easier adjustment and match to jig screen. Press "MENU", THEN PRESS "RECALL".
(2) Perform interpolation and data write to ROM after green adjustment. Once green has been confirmed to match jig screen, the jig screen can be removed. Do not readjust the green color after jig screen has been removed. This is now your reference color.
(3) Display green and red only and match red to green.
(4) Display all colors and match blue to green and red. Touch-up red color if necessary.
(5) Existing DATA in ROM can be read by pressing the SWAP button 2 times. This data can be used after replacing a component (CRT, DY, etc.) Where complete convergence adjustment is not necessary be careful not to overwrite this data.
DO NOT write cleared RAM data into ROM or a complete convergence adjustment will be necessary. Remember to try MAGIC FOCUS before starting convergence adjustment to minimize adjustment time.

3.4.3 Digital convergence remote control


TV
POWER
CABLE
VCR/AUDIO
ROM READ
ROM WRITE
PIP
SWAP
SHIFT
CALCULATION
PHASE
SRD
AI
FRZ
RASTER POSITION
INITIALIZE
ANT
CBL▲
CBL▼
TV
CABLE
VCR
AUDIO
ADJUSTMENT
REMOVE COLOR
MENU
ENTER
CROSSHATCH / VIDEO MODE
VOL
LST-CH
CH
MUTE
CURSOR UP
1
2
3
LIGHT
CURSOR LEFT
4
5
6
CURSOR RIGHT
CURSOR DOWN
7
8
9
AVX
RECALL
BLUE (13x9 Adj.)
0
GREEN (3x3 Adj.)
RED (7x5 Adj.)
HITACHI
CLU-951MP

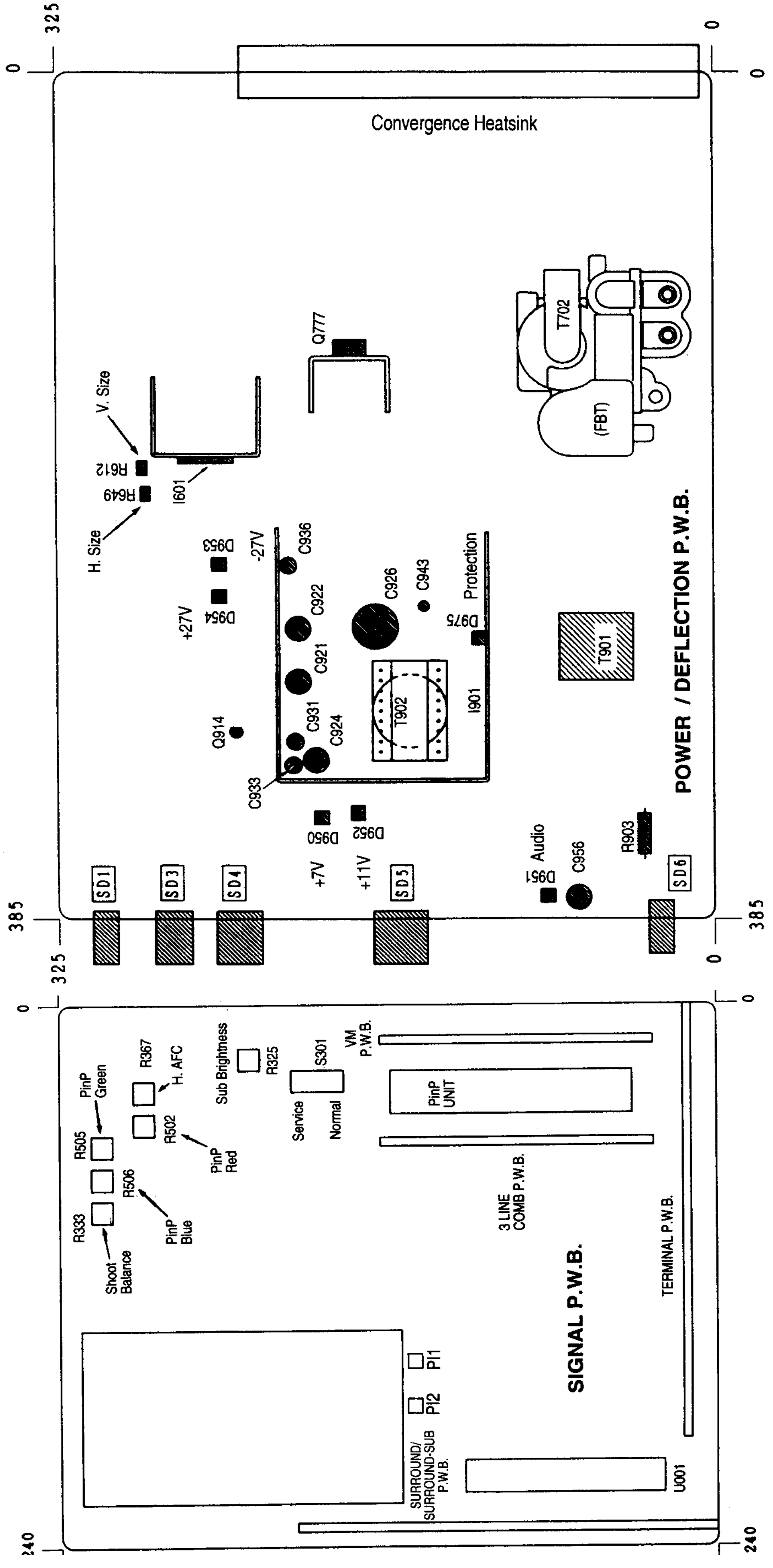
4. ADJUSTMENT POINT

4.1 CRT, cabinet locations

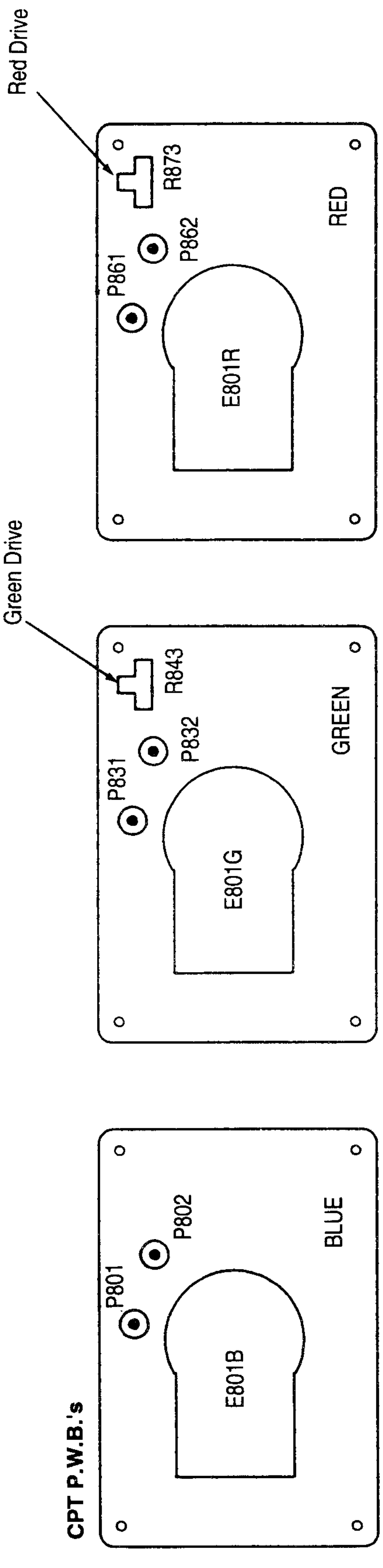


1. CENTERING MAGNET FOR RED PRT
2. CENTERING MAGNET FOR GREEN PRT
3. CENTERING MAGNET FOR BLUE PRT
4. 4-POLE MAGNET FOR BEAM FORM ADJUSTMENT
5. BEAM ALIGNMENT MAGNET
6. DIGITAL CONVERGENCE MODULE
7. FOCUS PACK (TOP ADJUSTMENTS FOR FOCUS, BOTTOM FOR SCREEN)

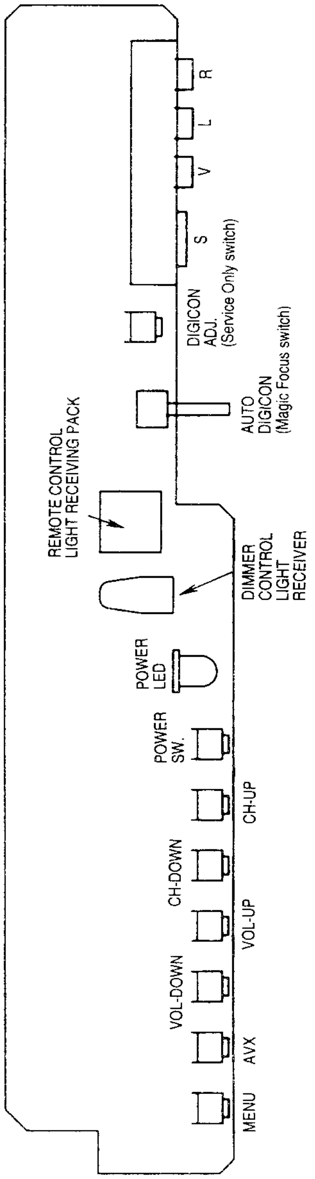
4.2 Signal PWB, Power/Deflection P.W.B. adjustment points


325
0
0
0
Convergence Heatsink
V. Size
R612
R649
H. Size
I601
Q777
T702
(FBT)
D953
D954
+27V
-27V
C936
C922
C926
C943
Protection
D975
C921
T902
I901
T901
Q914
C931
C924
C933
D950
D952
+7V
+11V
Audio
D951
C956
R903
SD1
SD3
SD4
SD5
SD6
POWER / DEFLECTION P.W.B.
385
325
0
385
0
0
PinP Green
R505
R506
R333
Shoot Balance
PinP Blue
R502
PinP Red
R367
H. AFC
Sub Brightness
R325
S301
Service
Normal
VM P.W.B.
PinP UNIT
3 LINE COMB P.W.B.
SIGNAL P.W.B.
TERMINAL P.W.B.
PI1
PI2
SURROUND/ SURROUND-SUB P.W.B.
U001
240
240

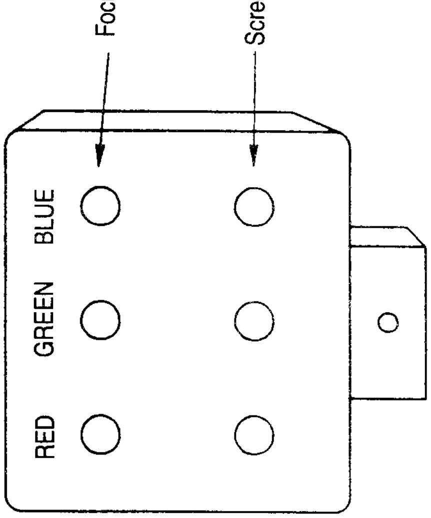
4.3 CPT, Control P.W.B., Focus Pack adjustment points


Red Drive
R873
P861
P862
E801R
RED
Green Drive
R843
P831
P832
E801G
GREEN
P801
P802
E801B
BLUE

CPT P.W.B.'s


R
L
V
S
(Service Only switch)
DIGICON
ADJ.
AUTO
DIGICON
(Magic Focus switch)
REMOTE CONTROL
LIGHT RECEIVING PACK
DIMMER
CONTROL
LIGHT
RECEIVER
POWER
LED
POWER
SW.
CH-UP
CH-DOWN
VOL-UP
VOL-DOWN
AVX
MENU

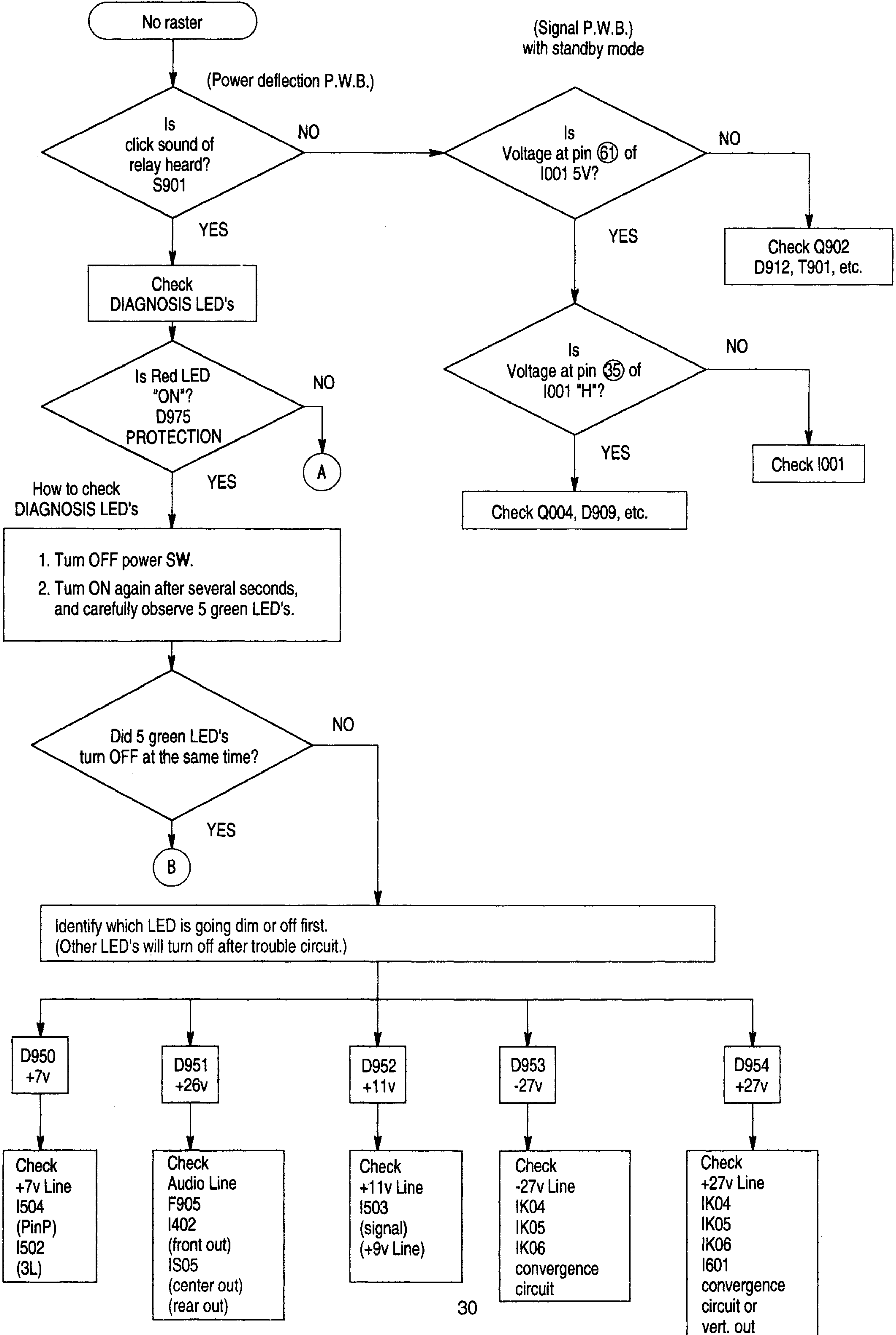
CONTROL P.W.B.

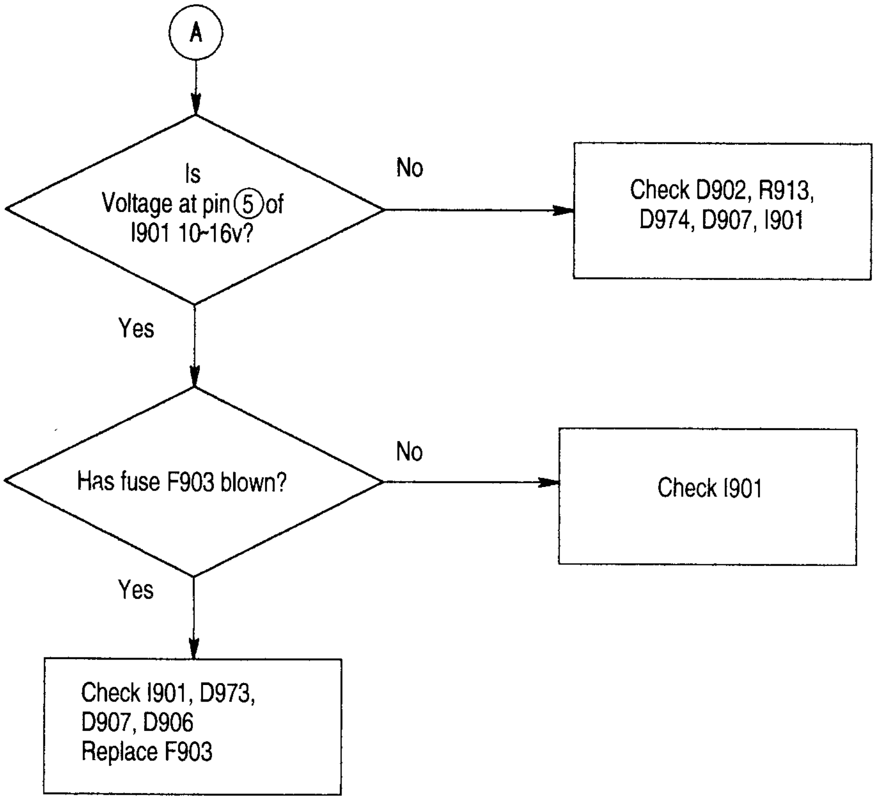

Focus
Screen
RED
GREEN
BLUE

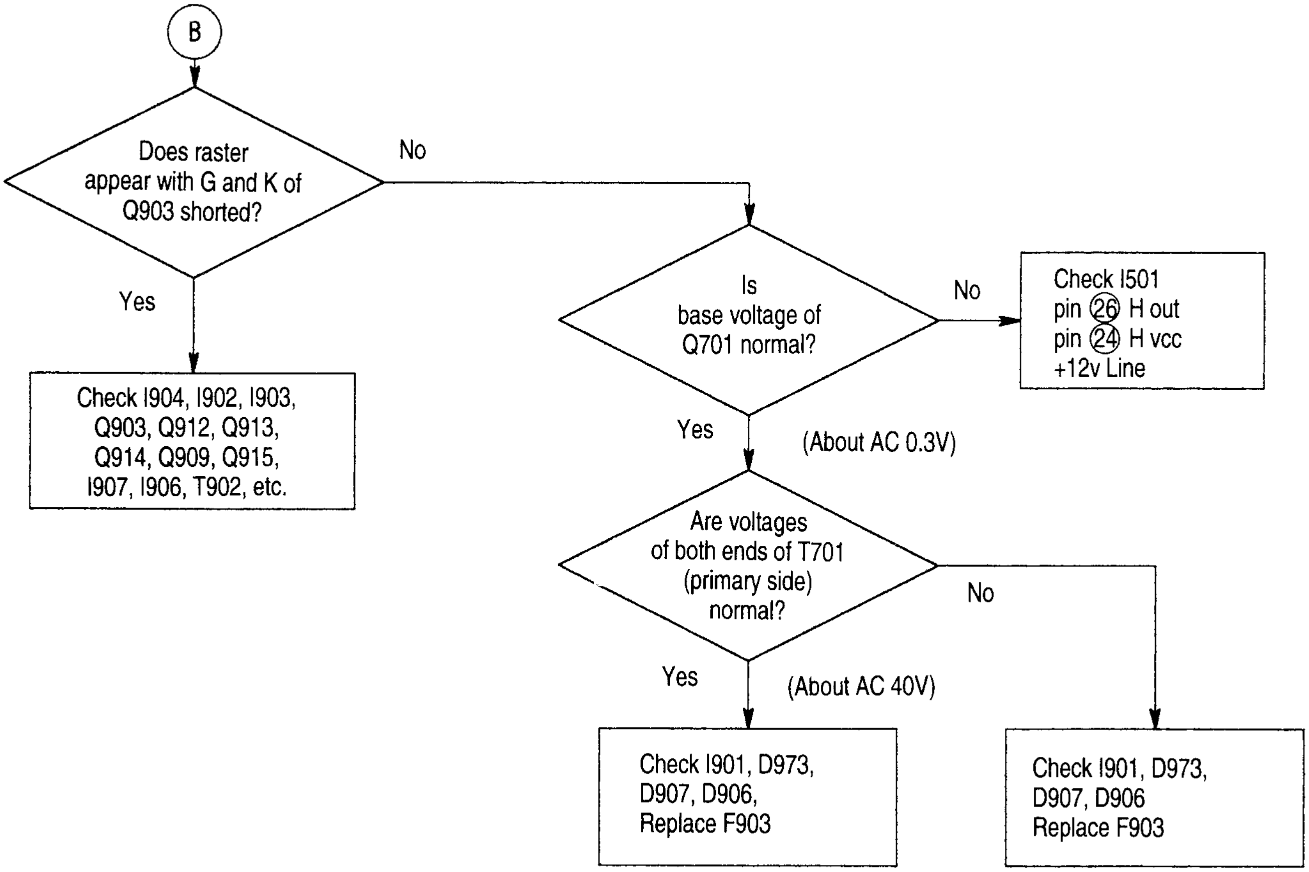
FOCUS PACK

TROUBLESHOOTING

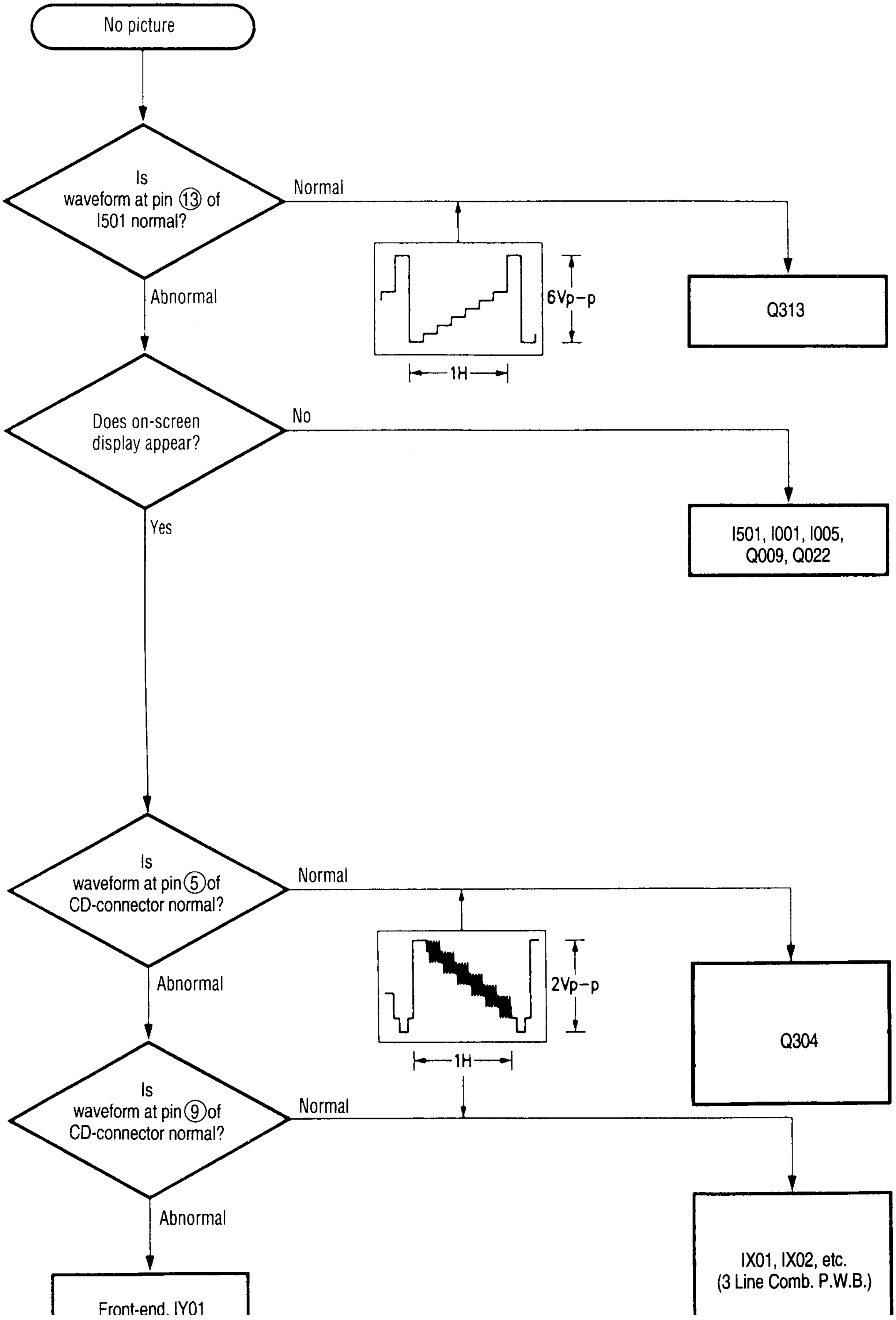
1. No raster


No raster
(Power deflection P.W.B.)
Is click sound of relay heard? S901
NO
YES
Check DIAGNOSIS LED's
Is Red LED "ON"? D975 PROTECTION
NO
A
YES
How to check DIAGNOSIS LED's
1. Turn OFF power SW.
2. Turn ON again after several seconds, and carefully observe 5 green LED's.
Did 5 green LED's turn OFF at the same time?
NO
YES
B
Identify which LED is going dim or off first.
(Other LED's will turn off after trouble circuit.)
D950 +7v
D951 +26v
D952 +11v
D953 -27v
D954 +27v
Check +7v Line I504 (PinP) I502 (3L)
Check Audio Line F905 I402 (front out) IS05 (center out) (rear out)
Check +11v Line I503 (signal) (+9v Line)
Check -27v Line IK04 IK05 IK06 convergence circuit
Check +27v Line IK04 IK05 IK06 I601 convergence circuit or vert. out
(Signal P.W.B.) with standby mode
Is Voltage at pin ⑥① of I001 5V?
NO
YES
Check Q902 D912, T901, etc.
Is Voltage at pin ㉟ of I001 "H"?
NO
YES
Check I001
Check Q004, D909, etc.

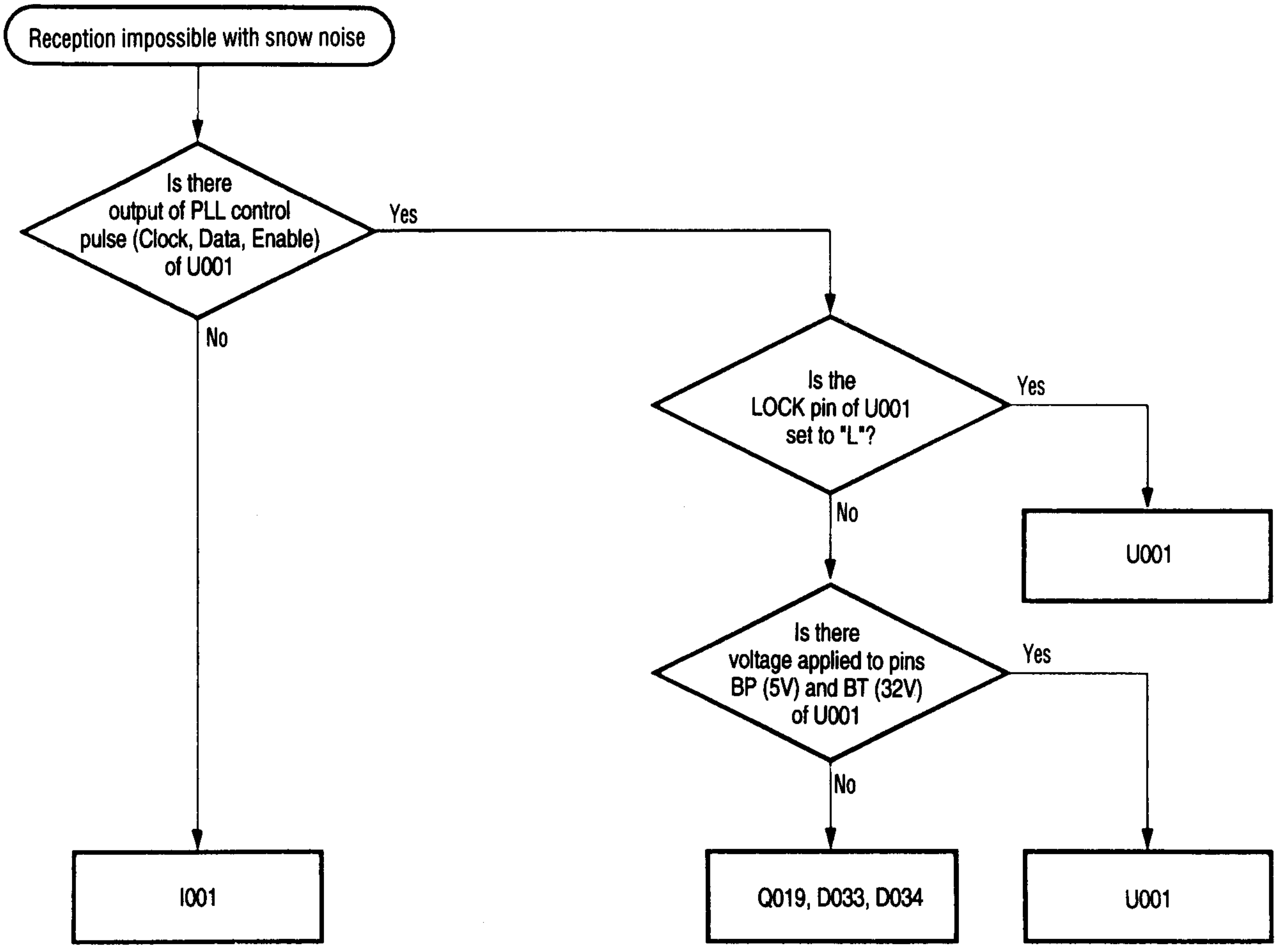

A
Is Voltage at pin ⑤ of I901 10-16v?
No
Check D902, R913, D974, D907, I901
Yes
Has fuse F903 blown?
No
Check I901
Yes
Check I901, D973, D907, D906 Replace F903


B
Does raster appear with G and K of Q903 shorted?
No
Yes
Check I904, I902, I903, Q903, Q912, Q913, Q914, Q909, Q915, I907, I906, T902, etc.
Is base voltage of Q701 normal?
No
Check I501 pin ㉖ H out pin ㉔ H vcc +12v Line
Yes
(About AC 0.3V)
Are voltages of both ends of T701 (primary side) normal?
No
Yes
(About AC 40V)
Check I901, D973, D907, D906, Replace F903
Check I901, D973, D907, D906 Replace F903

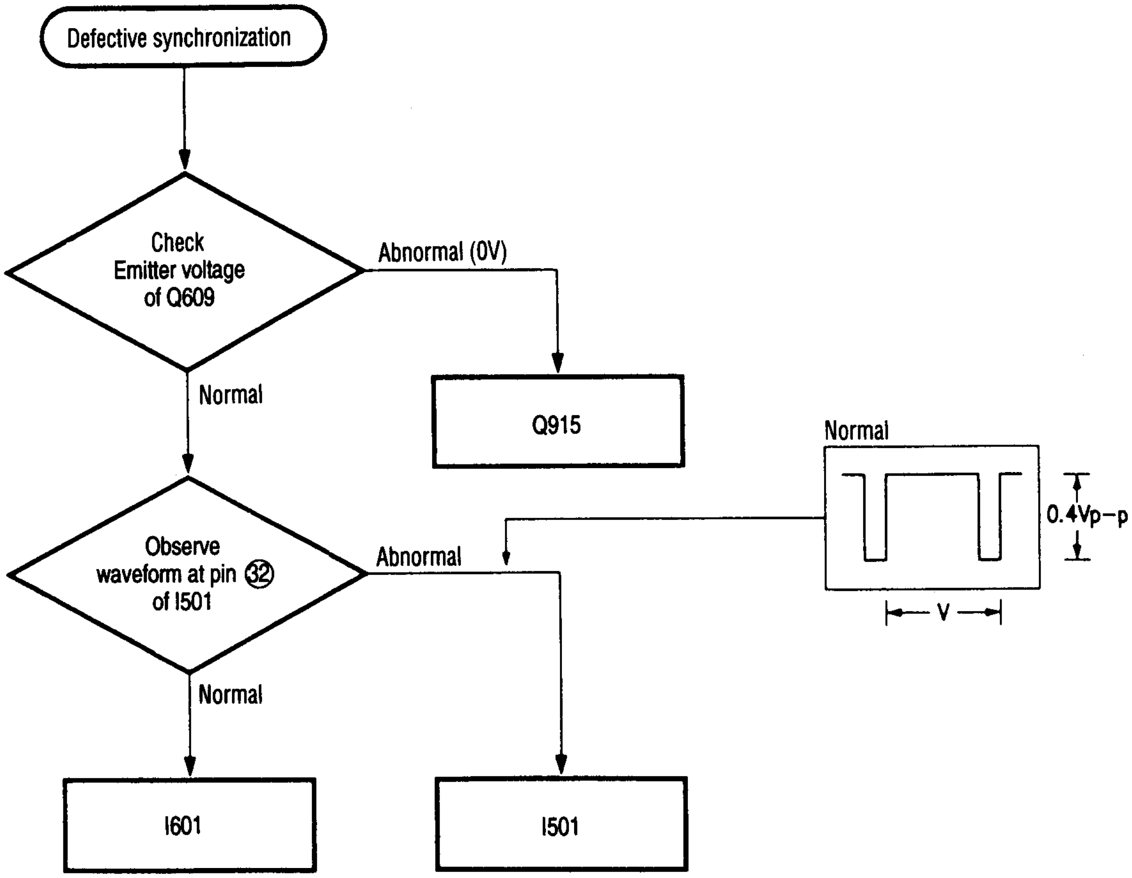
2. No picture


No picture
Is waveform at pin ⑬ of I501 normal?
Normal
Abnormal
6Vp−p
1H
Q313
Does on-screen display appear?
No
Yes
I501, I001, I005, Q009, Q022
Is waveform at pin ⑤ of CD-connector normal?
Normal
Abnormal
2Vp−p
1H
Q304
Is waveform at pin ⑨ of CD-connector normal?
Normal
Abnormal
Front-end, IY01
IX01, IX02, etc. (3 Line Comb. P.W.B.)

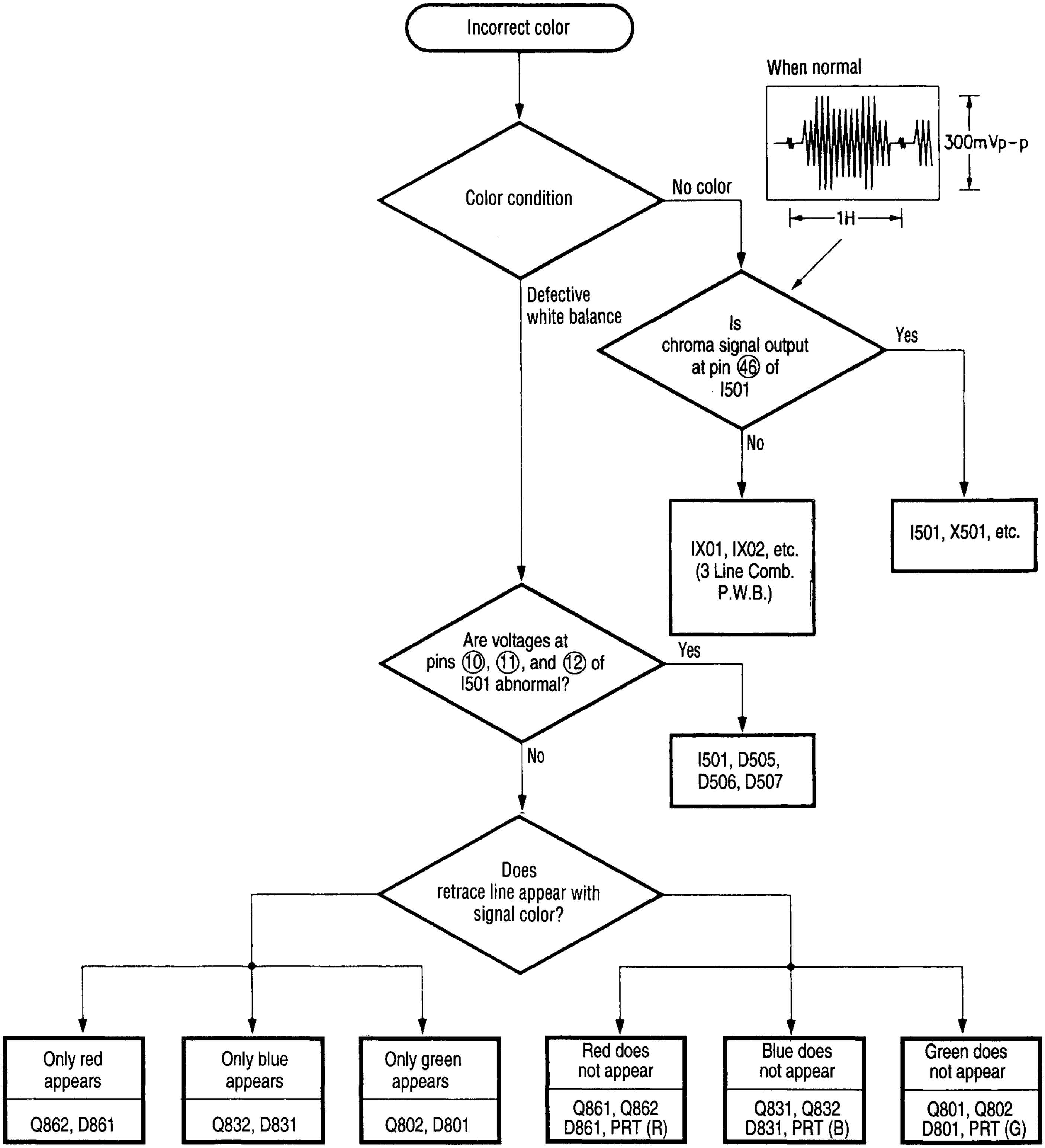
3. Reception impossible with snow noise


Reception impossible with snow noise
Is there output of PLL control pulse (Clock, Data, Enable) of U001
Yes
No
Is the LOCK pin of U001 set to "L"?
Yes
No
U001
Is there voltage applied to pins BP (5V) and BT (32V) of U001
Yes
No
I001
Q019, D033, D034
U001

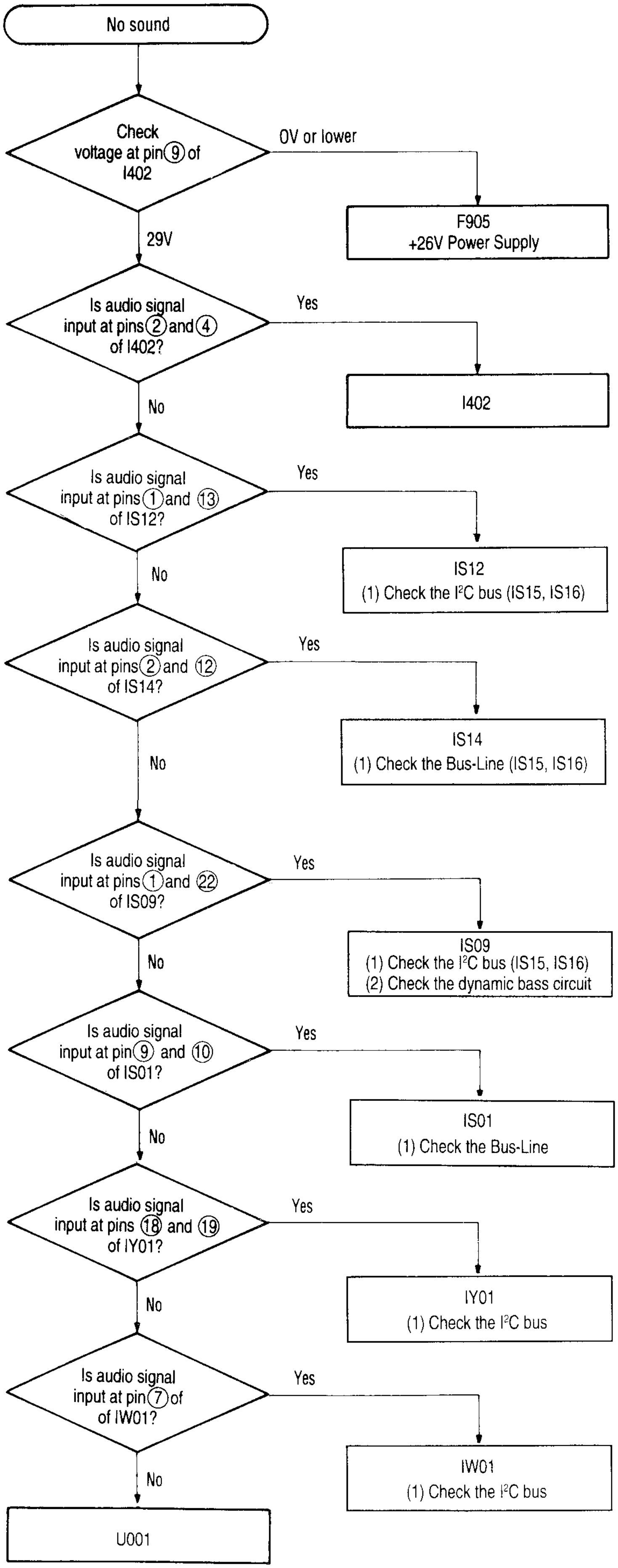
4. Defective synchronization


Defective synchronization
Check Emitter voltage of Q609
Abnormal (0V)
Normal
Q915
Observe waveform at pin ㉜ of I501
Abnormal
Normal
I601
I501
Normal
0.4Vp-p
V

5. Incorrect color


Incorrect color
When normal
300mVp-p
1H
Color condition
No color
Defective white balance
Is chroma signal output at pin ㊻ of I501
Yes
No
IX01, IX02, etc. (3 Line Comb. P.W.B.)
I501, X501, etc.
Are voltages at pins ⑩, ⑪, and ⑫ of I501 abnormal?
Yes
No
I501, D505, D506, D507
Does retrace line appear with signal color?
Only red appears
Q862, D861
Only blue appears
Q832, D831
Only green appears
Q802, D801
Red does not appear
Q861, Q862 D861, PRT (R)
Blue does not appear
Q831, Q832 D831, PRT (B)
Green does not appear
Q801, Q802 D801, PRT (G)

6. No sound (when Surround OFF)


No sound
Check voltage at pin⑨of I402
0V or lower
F905 +26V Power Supply
29V
Is audio signal input at pins②and④ of I402?
Yes
I402
No
Is audio signal input at pins①and ⑬ of IS12?
Yes
IS12 (1) Check the I²C bus (IS15, IS16)
No
Is audio signal input at pins②and ⑫ of IS14?
Yes
IS14 (1) Check the Bus-Line (IS15, IS16)
No
Is audio signal input at pins①and ㉒ of IS09?
Yes
IS09 (1) Check the I²C bus (IS15, IS16) (2) Check the dynamic bass circuit
No
Is audio signal input at pin⑨ and ⑩ of IS01?
Yes
IS01 (1) Check the Bus-Line
No
Is audio signal input at pins ⑱ and ⑲ of IY01?
Yes
IY01 (1) Check the I²C bus
No
Is audio signal input at pin⑦of of IW01?
Yes
IW01 (1) Check the I²C bus
No
U001

7. Convergence errors

If an error message or code appears while performing MAGIC FOCUS or Initialize (SHIFT, ANT in service mode) follow this confirmation and repair method.

1. Turn on power and receive any signal.
2. Press front panel service switch.
3. Press "SWAP", "ANT" on remote control.
4. Error code will be displayed in bottom right corner of screen. If there is no error, a green dot pattern will appear on screen.
5. Follow repair table for errors.

DCU REPAIR TABLE

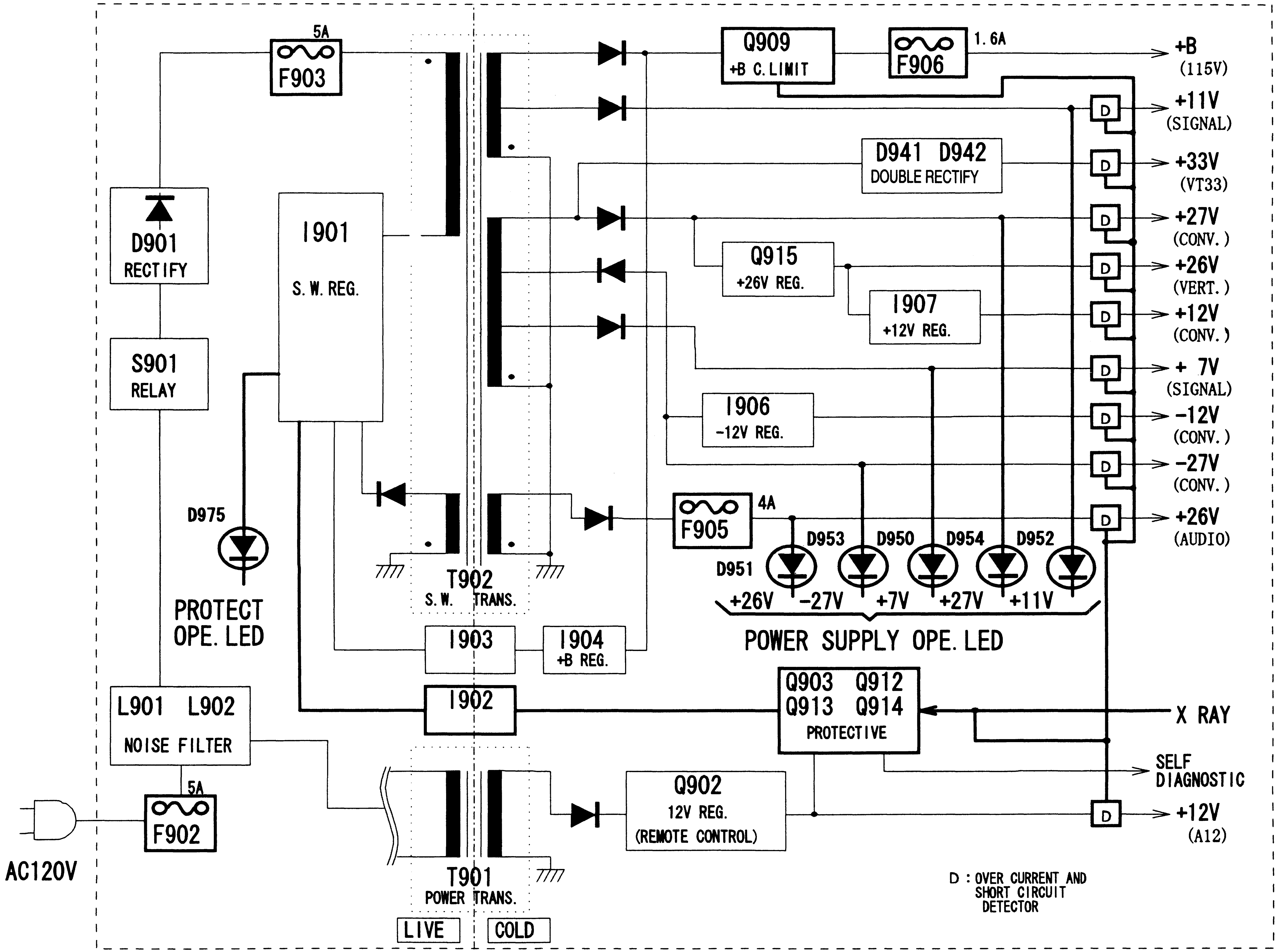
Error	Error Display Code	Countermeasure	Application	
			Initialize	Magic Focus
1	VF Error	Replace DCU	X	X
2 *2	Connect 1	1. Darken outside light 2. Placing of sensor 3. Is pattern hitting sensor 4. Check connection and solder bridge of sensor 5. Replace sensor 6. Replace sensor R.W.B. 7. Censor Connector check 8. Replace DCU 9. Adjustment check (H/V size, centering) 10. Parameter data and port 80-87 check	X	--
3*2	A/D Level	10 items listed above and parameter and E. detect check	X	X
4	Over Flow	1. Check the placement of sensor 2. Adjustment check (H/V size, centering) 3. Conv. Amp gain check *1 4. Pattern Data check	X	X
5	Convergence	4 of items listed above and 5. parameters and E. detect check and 6. parameter E. conver check	X	X
7	Operation	Same as Error Code 4	--	X
9	Connect 2	Same as Error Code 2	X	X
10	Noise	Input strong field strength signal. Check the wiring of connector between sensor and DCU.	X	X
11	SYNC	Input strong field strong signal. Input standard signal NTSC	X	X

*1 --RK 15, 16, 20, 21, 25, 26, 30, 31, 35, 36, 41, 42 check these resistors.

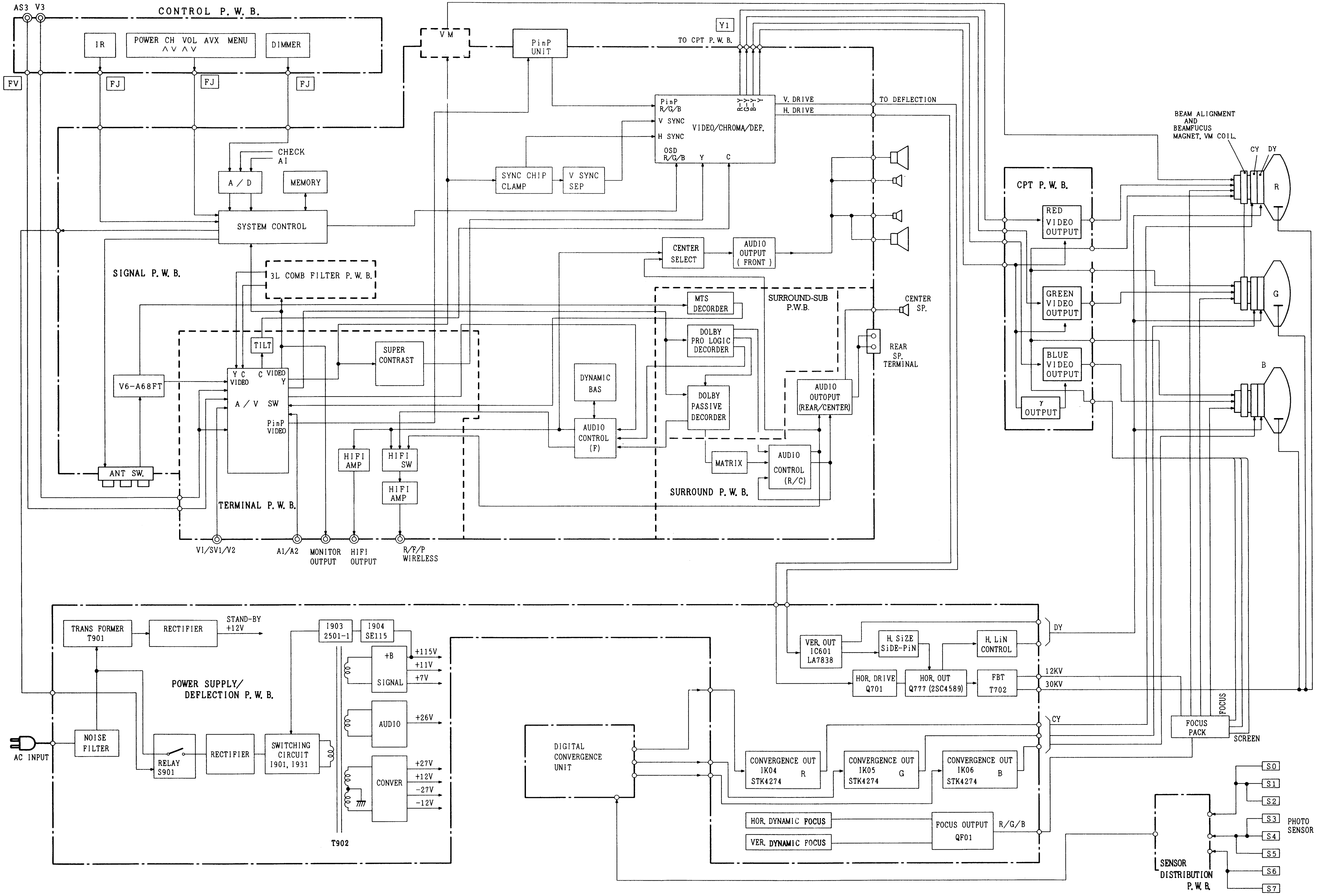
*2 Sensor Position (View from front side)

0	1	2
7		3
6	5	4

PROTECTION CIRCUIT BLOCK DIAGRAM

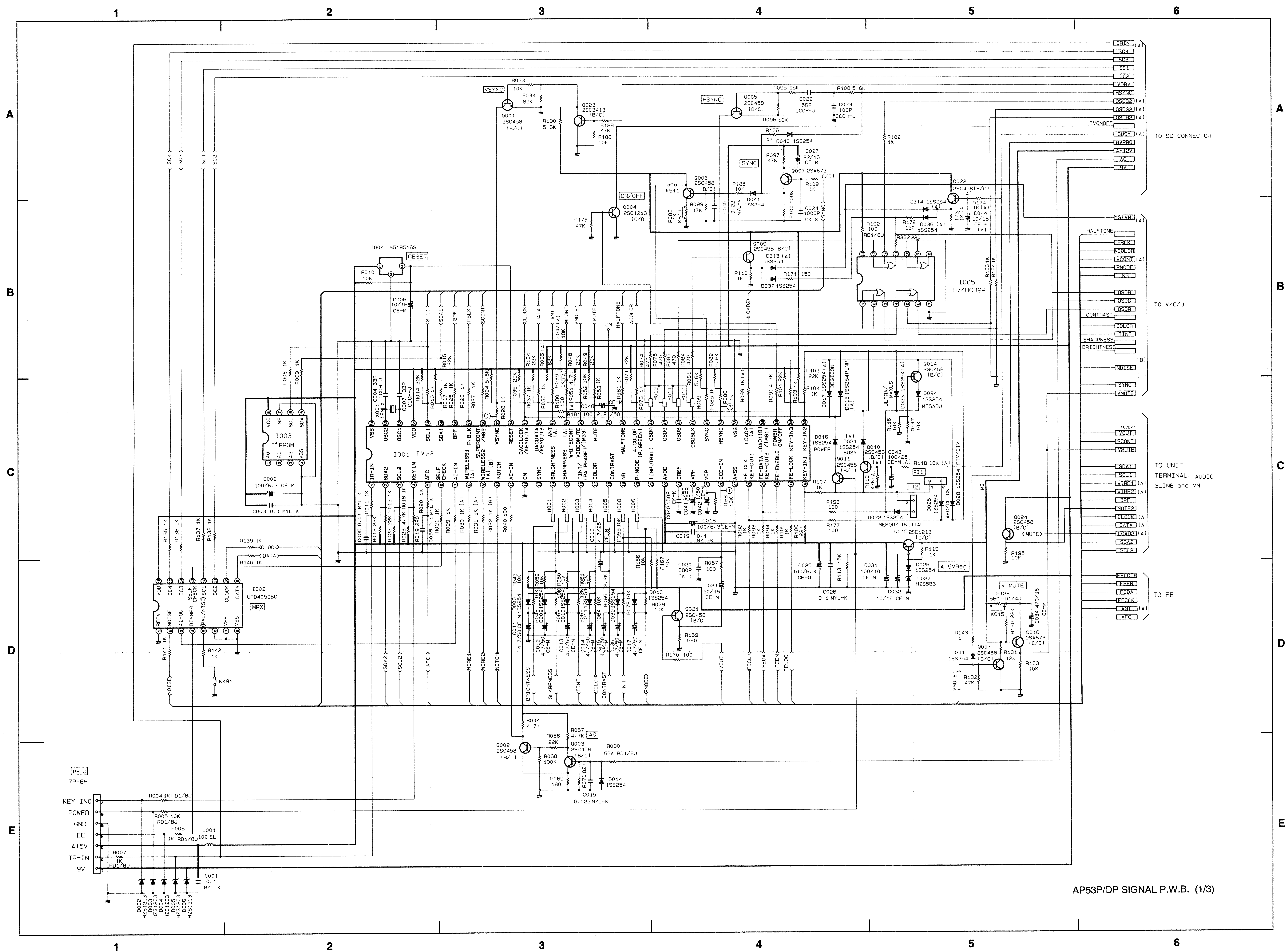

5A
F903
D901
RECTIFY
S901
RELAY
I901
S.W. REG.
D975
PROTECT
OPE. LED
L901 L902
NOISE FILTER
5A
F902
AC120V
T902
S.W. TRANS.
I903
I904
+B REG.
I902
T901
POWER TRANS.
LIVE
COLD
Q909
+B C.LIMIT
F906
1.6A
D941 D942
DOUBLE RECTIFY
Q915
+26V REG.
I907
+12V REG.
I906
-12V REG.
F905
4A
D951
D953
D950
D954
D952
+26V
-27V
+7V
+27V
+11V
POWER SUPPLY OPE. LED
Q903 Q912
Q913 Q914
PROTECTIVE
Q902
12V REG.
(REMOTE CONTROL)
D
+B
(115V)
+11V
(SIGNAL)
+33V
(VT33)
+27V
(CONV.)
+26V
(VERT.)
+12V
(CONV.)
+ 7V
(SIGNAL)
-12V
(CONV.)
-27V
(CONV.)
+26V
(AUDIO)
X RAY
SELF
DIAGNOSTIC
+12V
(A12)
D : OVER CURRENT AND
SHORT CIRCUIT
DETECTOR

AP53P/DP BLOCK DIAGRAM


AS3
V3
CONTROL P. W. B.
IR
POWER CH VOL AVX MENU
∧∨ ∧∨
DIMMER
FV
FJ
FJ
FJ
VM
PinP UNIT
Y1
TO CPT P. W. B.
PinP R/G/B
V SYNC
H SYNC
OSD R/G/B
Y
C
VIDEO/CHROMA/DEF.
R G B
V. DRIVE
H. DRIVE
TO DEFLECTION
CHECK
AI
A / D
MEMORY
SYSTEM CONTROL
SYNC CHIP CLAMP
V SYNC SEP
CENTER SELECT
AUDIO OUTPUT (FRONT)
SIGNAL P. W. B.
3L COMB FILTER P. W. B.
MTS DECORDER
SURROUND-SUB P.W.B.
CENTER SP.
DOLBY PRO LOGIC DECORDER
REAR SP. TERMINAL
TILT
SUPER CONTRAST
DYNAMIC BAS
V6-A68FT
Y C VIDEO
C
VIDEO Y
A / V SW
PinP VIDEO
DOLBY PASSIVE DECORDER
AUDIO OUTOPUT (REAR/CENTER)
AUDIO CONTROL (F)
HIFI AMP
HIFI SW
HIFI AMP
MATRIX
AUDIO CONTROL (R/C)
ANT SW.
TERMINAL P. W. B.
SURROUND P. W. B.
VI/SVI/V2
A1/A2
MONITOR OUTPUT
HIFI OUTPUT
R/F/P WIRELESS
BEAM ALIGNMENT AND BEAMFUCUS MAGNET, VM COIL
CY
DY
CPT P. W. B.
RED VIDEO OUTPUT
R
GREEN VIDEO OUTPUT
G
BLUE VIDEO OUTPUT
B
Y OUTPUT
TRANS FORMER T901
RECTIFIER
STAND-BY +12V
I903 2501-1
I904 SE115
+B
SIGNAL
+115V
+11V
+7V
POWER SUPPLY/ DEFLECTION P. W. B.
AUDIO
+26V
NOISE FILTER
RELAY S901
RECTIFIER
SWITCHING CIRCUIT I901, I931
CONVER
+27V
+12V
-27V
-12V
AC INPUT
T902
VER. OUT IC601 LA7838
H. SiZE SiDE-PiN
H. LiN CONTROL
DY
HOR. DRIVE Q701
HOR. OUT Q777 (2SC4589)
FBT T702
12KV
30KV
CY
FOCUS
FOCUS PACK
SCREEN
DIGITAL CONVERGENCE UNIT
CONVERGENCE OUT IK04 STK4274 R
CONVERGENCE OUT IK05 STK4274 G
CONVERGENCE OUT IK06 STK4274 B
HOR. DYNAMIC FOCUS
VER. DYNAMIC FOCUS
FOCUS OUTPUT QF01
R/G/B
S0
S1
S2
S3
S4
S5
S6
S7
PHOTO SENSOR
SENSOR DISTRIBUTION P. W. B.

BASIC CIRCUIT DIAGRAM

PRODUCT SAFETY NOTE: Components marked with a ⚠ and shaded have special characteristics important to safety. Before replacing any of these components, read carefully the PRODUCT SAFETY NOTICE of this Service Manual. Don't degrade the safety of the receiver through improper servicing.


1
2
3
4
5
6
A
B
C
D
E
I001 TVμP
I002 UPD4052BC
MPX
I003 E²PROM
I004 M51951BSL
RESET
I005 HD74HC32P
Q001 2SC458 (B/C)
Q002 2SC458 (B/C)
Q003 2SC458 (B/C)
Q004 2SC1213 (C/D)
Q005 2SC458 (B/C)
Q006 2SC458 (B/C)
Q007 2SA673 (C/D)
Q009 2SC458 (B/C)
Q010 2SC458 (B/C)
Q011 2SC458 (B/C)
Q014 2SC458 (B/C)
Q015 2SC1213 (C/D)
Q016 2SA673 (C/D)
Q017 2SC458 (B/C)
Q021 2SC458 (B/C)
Q022 2SC458 (B/C)
Q023 2SC3413 (B/C)
Q024 2SC458 (B/C)
VSYNC
HSYNC
SYNC
ON/OFF
AC
V-MUTE
A+5VReg
MEMORY INITIAL
POWER
BUSY
TO SD CONNECTOR
TO V/C/J
TO UNIT TERMINAL, AUDIO 3LINE and VM
TO FE
PF J
7P-EH
KEY-IND
POWER
GND
EE
A+5V
IR-IN
9V
IRIN
SC4
SC3
SC1
SC2
VDRV
HSYNC
OSDB2
OSDG2
OSDR2
TVONOFF
BUSY
HVPRO
A+12V
AC
9V
VSYNC
HALFTONE
PBLK
COLOR
WCONT
PMODE
NR
OSDB
OSDG
OSDR
CONTRAST
COLOR
TINT
SHARPNESS
BRIGHTNESS
NOISE
SYNC
VMUTE
VOUT
SCONT
VMUTE
SDA1
SCL1
WIRE1
WIRE2
BPF
MUTE2
CLOCK
DATA
LOAD2
SDA2
SCL2
FELOCK
FEEN
FEDA
FECLK
ANT
AFC
AP53P/DP SIGNAL P.W.B. (1/3)

- All DC voltage to be measured with a tester (100kΩ/V). Voltage taken on a complex color bar signal including a standard color bar signal.
- Since this is a basic circuit diagram, the value of the parts is subject to be altered for improvement.

Circuit No.	Pin No.	Voltage VDC
I001	1	0.1
	2	5.1
	3	5.1
	4	5.2
	5	3.2
	6	0.5
	7	2.4
	8	5.2
	9	0
	10	0
	11	2.5
	12	0
	13	2.6
	14	2.4
	15	2.4
	16	2.6
	17	2.5
	18	7.3
	19	8.9
	20	8.8
	21	0
	22	5.2
	23	0
	24	1.3
	25	1.1
	26	2.0
	27	0
	28	5.0
	29	5.0
	30	0.2
	31	0.1
	32	5.2

Circuit No.	Pin No.	Voltage VDC
I001	33	5.0
	34	5.0
	35	5.1
	36	0
	37	5.2
	38	0
	39	4.8
	40	0.1
	41	0
	42	0
	43	0
	44	0
	45	8.1
	46	0
	47	0
	48	0
	49	0
	50	0
	51	0.7
	52	5.2
	53	5.2
	54	5.2
	55	5.0
	56	0
	57	0
	58	5.2
	59	5.1
	60	5.1
	61	5.2
	62	2.4
	63	2.2
	64	0

Circuit No.	Pin No.	Voltage VDC
I002	1	0
	2	3.8
	3	2.4
	4	2.4
	5	0
	6	0
	7	0
	8	0
	9	5.2
	10	5.2
	11	0.5
	12	0.3
	13	0.5
	14	0.1
	15	0.1
	16	5.2

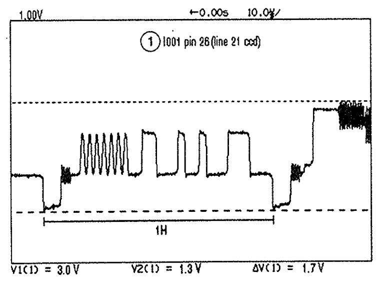
Circuit No.	Pin No.	Voltage VDC
I003	1	0
	2	0
	3	0
	4	0
	5	5.1
	6	5.1
	7	0
	8	5.2

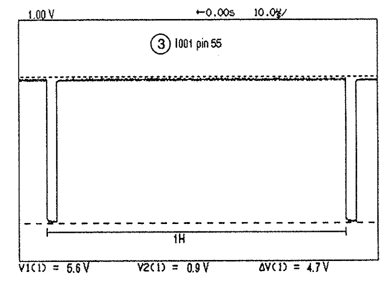
Circuit No.	Pin No.	Voltage VDC
I004	1	5.2
	2	0
	3	5.2

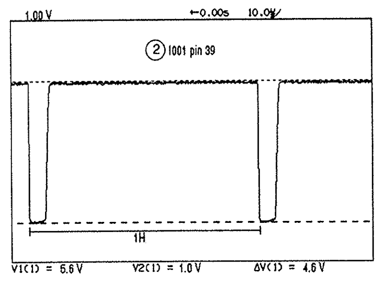
Circuit No.	Pin No.	Voltage VDC
I005	1	0
	2	0
	3	0
	4	0
	5	0
	6	0
	7	0
	8	0
	9	0
	10	0
	11	0
	12	0
	13	0
	14	5.2

Circuit No.	Pin No.	Voltage VDC
Q001	B	0.1
	C	5.0
	E	0
Q002	B	0.6
	C	2.5
	E	0.2
Q003	B	0.4
	C	2.5
	E	0.2
Q004	B	0.7
	C	0.1
	E	0
Q005	B	0
	C	4.8
	E	0
Q006	B	0.7
	C	0.1
	E	0
Q007	B	5.3
	C	0.8
	E	5.2
Q009	B	0
	C	5.2
	E	0
Q010	B	0
	C	5.2
	E	0.1

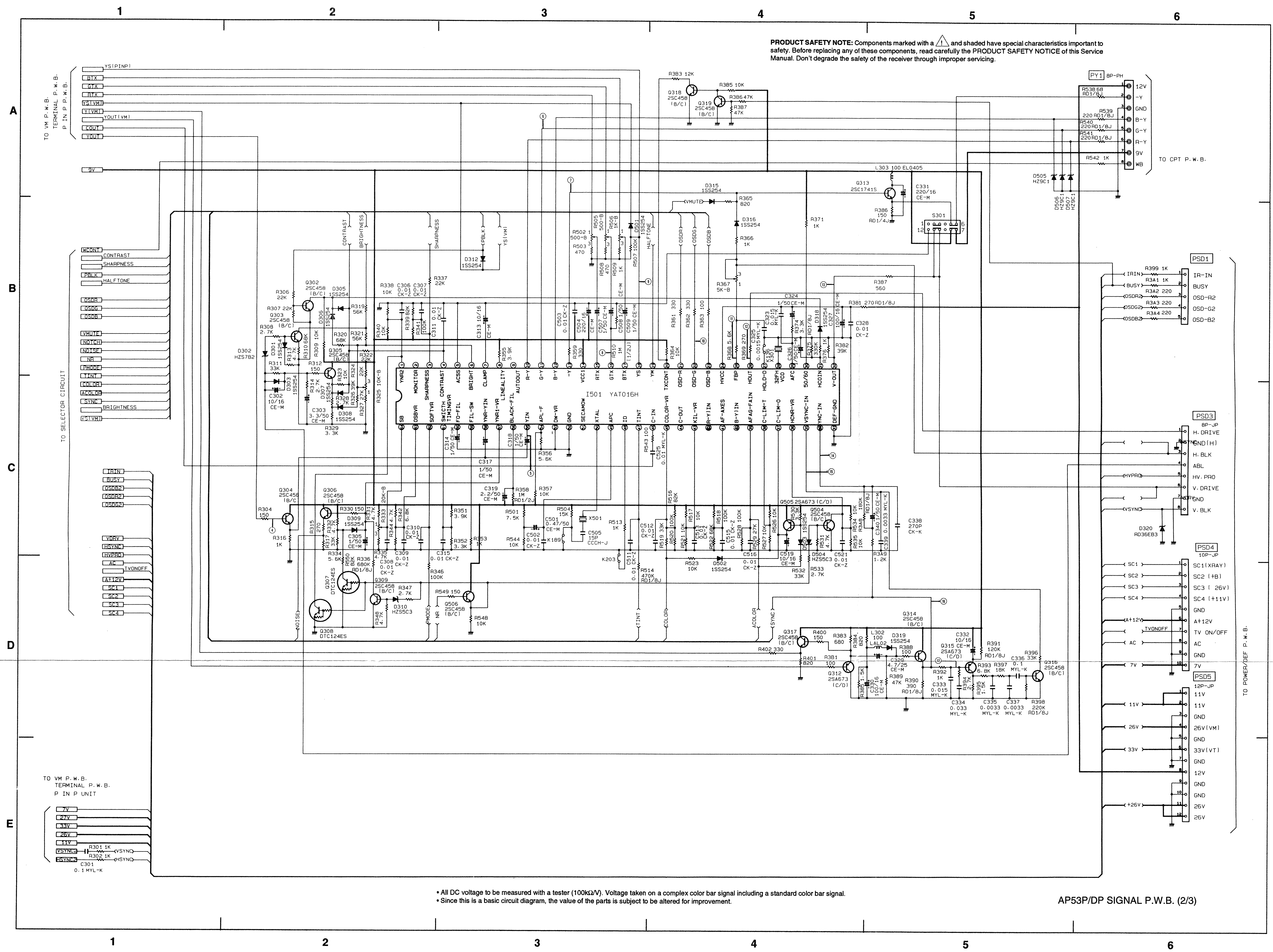
Circuit No.	Pin No.	Voltage VDC
Q011	B	0
	C	5.2
	E	0
Q014	B	0
	C	5.0
	E	0
Q015	B	5.9
	C	12.4
	E	5.2
Q016	B	12.4
	C	0
	E	12.4
Q017	B	0
	C	12.3
	E	0
Q021	B	3.9
	C	9.1
	E	3.2
Q022	B	0
	C	5.2
	E	0
Q023	B	0.6
	C	0.2
	E	0
Q024	B	0
	C	9.1
	E	0


① I001 pin 26 (line 21 ccd)


③ I001 pin 55


② I001 pin 39

BASIC CIRCUIT DIAGRAM


1
2
3
4
5
6
A
B
C
D
E
TO VM P.W.B. TERMINAL P.W.B. P IN P P.W.B.
YS(PINP)
BTX
GTX
RTX
YS(VM)
Y(VM)
YOUT(VM)
COUT
YOUT
9V
TO SELECTOR CIRCUIT
WCONT
CONTRAST
SHARPNESS
PBLK
HALFTONE
OSDR
OSDG
OSDB
VMUTE
NOTCH
NOISE
NR
PHODE
TINT
COLOR
ACOLOR
SYNC
BRIGHTNESS
YS(VM)
IRIN
BUSY
OSDR2
OSDB2
OSDG2
VDRV
HSYNC
HVPRO
AC
TVONOFF
A+12V
SC1
SC2
SC3
SC4
TO VM P.W.B. TERMINAL P.W.B. P IN P UNIT
7V
27V
33V
26V
11V
VSYNC
HSYNC
I501 YAT016H
PY1 8P-PH
12V
-Y
GND
B-Y
G-Y
R-Y
9V
WB
TO CPT P.W.B.
PSD1
IR-IN
BUSY
OSD-R2
OSD-G2
OSD-B2
PSD3 8P-JP
H. DRIVE
GND(H)
H. BLK
ABL
HV. PRO
V. DRIVE
GND
V. BLK
PSD4 10P-JP
SC1(XRAY)
SC2 (+B)
SC3 (26V)
SC4 (+11V)
GND
A+12V
TV ON/OFF
AC
GND
7V
PSD5 12P-JP
11V
11V
GND
26V(VM)
GND
33V(VT)
GND
12V
GND
GND
26V
26V
TO POWER/DEF P.W.B.
S301
X501
K203
K189
L303 100 EL0405
Q302 2SC458 (B/C)
Q303 2SC458 (B/C)
Q304 2SC458 (B/C)
Q305 2SC458 (B/C)
Q306 2SC458 (B/C)
Q307 DTC124ES
Q308 DTC124ES
Q309 2SC458 (B/C)
Q312 2SA673 (C/D)
Q313 2SC1741S
Q314 2SC458 (B/C)
Q315 2SA673 (C/D)
Q316 2SC458 (B/C)
Q317 2SC458 (B/C)
Q318 2SC458 (B/C)
Q319 2SC458 (B/C)
Q504 2SC458 (B/C)
Q505 2SA673 (C/D)
Q506 2SC458 (B/C)
D302 HZS7B2
D320 RD36EB3
D505 HZ9C1

PRODUCT SAFETY NOTE: Components marked with a ⚠ and shaded have special characteristics important to safety. Before replacing any of these components, read carefully the PRODUCT SAFETY NOTICE of this Service Manual. Don't degrade the safety of the receiver through improper servicing.

- All DC voltage to be measured with a tester (100kΩ/V). Voltage taken on a complex color bar signal including a standard color bar signal.
- Since this is a basic circuit diagram, the value of the parts is subject to be altered for improvement.

AP53P/DP SIGNAL P.W.B. (2/3)

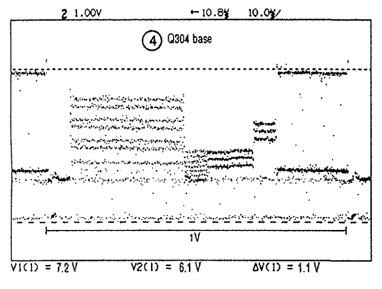
Circuit No.	Pin No.	Voltage VDC
I501	1	0
	2	0
	3	4.2
	4	7.1
	5	0
	6	4.6
	7	6.9
	8	8.9
	9	0.1
	10	5.1
	11	5.2
	12	5.3
	13	4.6
	14	9.1
	15	3.1
	16	3.1
	17	3.1
	18	0
	19	0
	20	4.9
	21	0
	22	0
	23	0
	24	7.8
	25	1.3
	26	0.8
	27	0
	28	5.0
	29	5.5
	30	8.8
	31	7.6
	32	4.5

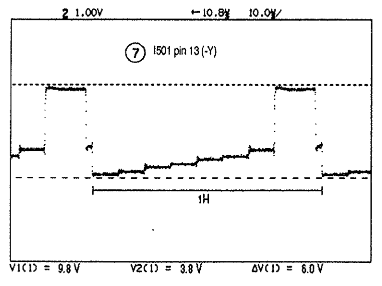
Circuit No.	Pin No.	Voltage VDC
I501	33	0
	34	7.0
	35	6.5
	36	0
	37	4.2
	38	4.0
	39	6.5
	40	1.3
	41	3.6
	42	1.3
	43	4.2
	44	6.5
	45	4.6
	46	3.2
	47	4.5
	48	0.7
	49	5.9
	50	5.5
	51	1.4
	52	0
	53	0
	54	3.3
	55	3.8
	56	6.1
	57	4.4
	58	3.8
	59	0
	60	4.3
	61	4.1
	62	6.0
	63	3.7
	64	5.5

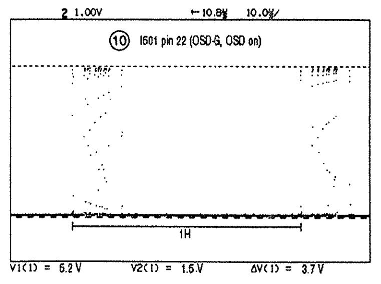
Circuit No.	Pin No.	Voltage VDC
Q302	B	0
	C	9.1
	E	0
Q303	B	1.0
	C	4.2
	E	0.5
Q304	B	6.6
	C	9.1
	E	6.0
Q305	B	8.1
	C	9.1
	E	7.4
Q306	B	4.4
	C	9.1
	E	3.8
Q307	B	8.1
	C	4.8
	E	0
Q308	B	8.1
	C	0
	E	0
Q309	B	0.7
	C	0
	E	0

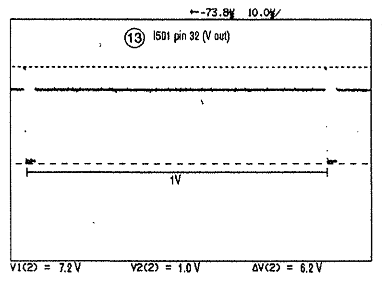
Circuit No.	Pin No.	Voltage VDC
Q312	B	4.6
	C	0
	E	5.2
Q313	B	4.7
	C	9.0
	E	4.0
Q314	B	6.0
	C	9.1
	E	5.3
Q315	B	5.3
	C	0
	E	5.2
Q316	B	-0.2
	C	6.4
	E	0
Q317	B	5.2
	C	9.1
	E	4.6
Q318	B	0.7
	C	0
	E	0
Q319	B	0
	C	0.7
	E	0

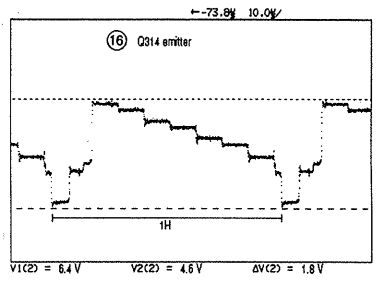
Circuit No.	Pin No.	Voltage VDC
Q504	B	0.7
	C	0
	E	0
Q505	B	9.0
	C	4.2
	E	9.1
Q506	B	8.8
	C	9.1
	E	8.1

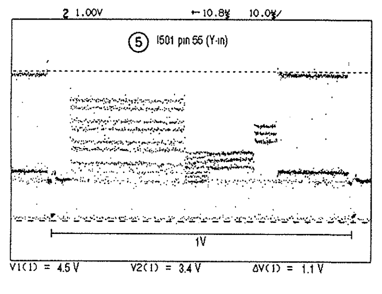


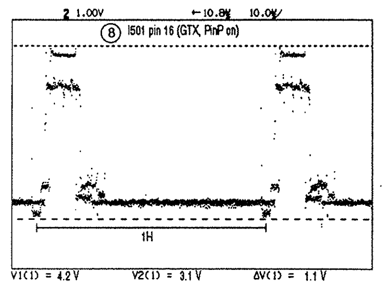


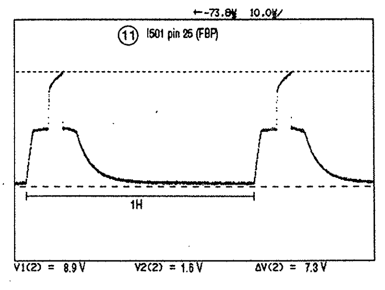


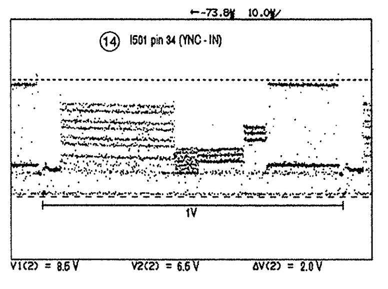


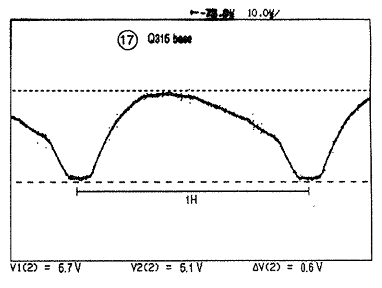


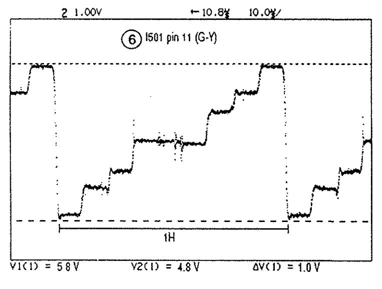


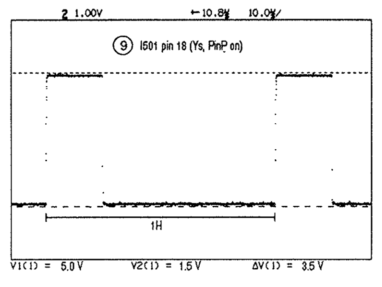


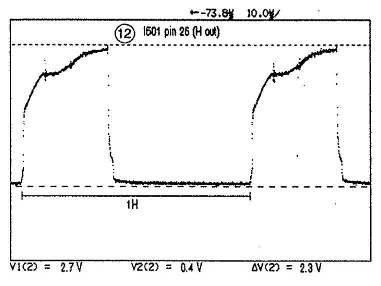


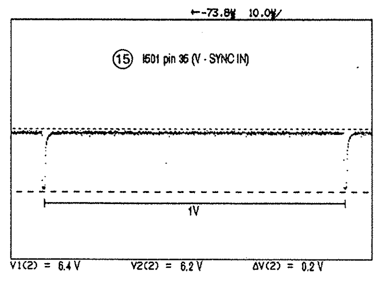












BASIC CIRCUIT DIAGRAM

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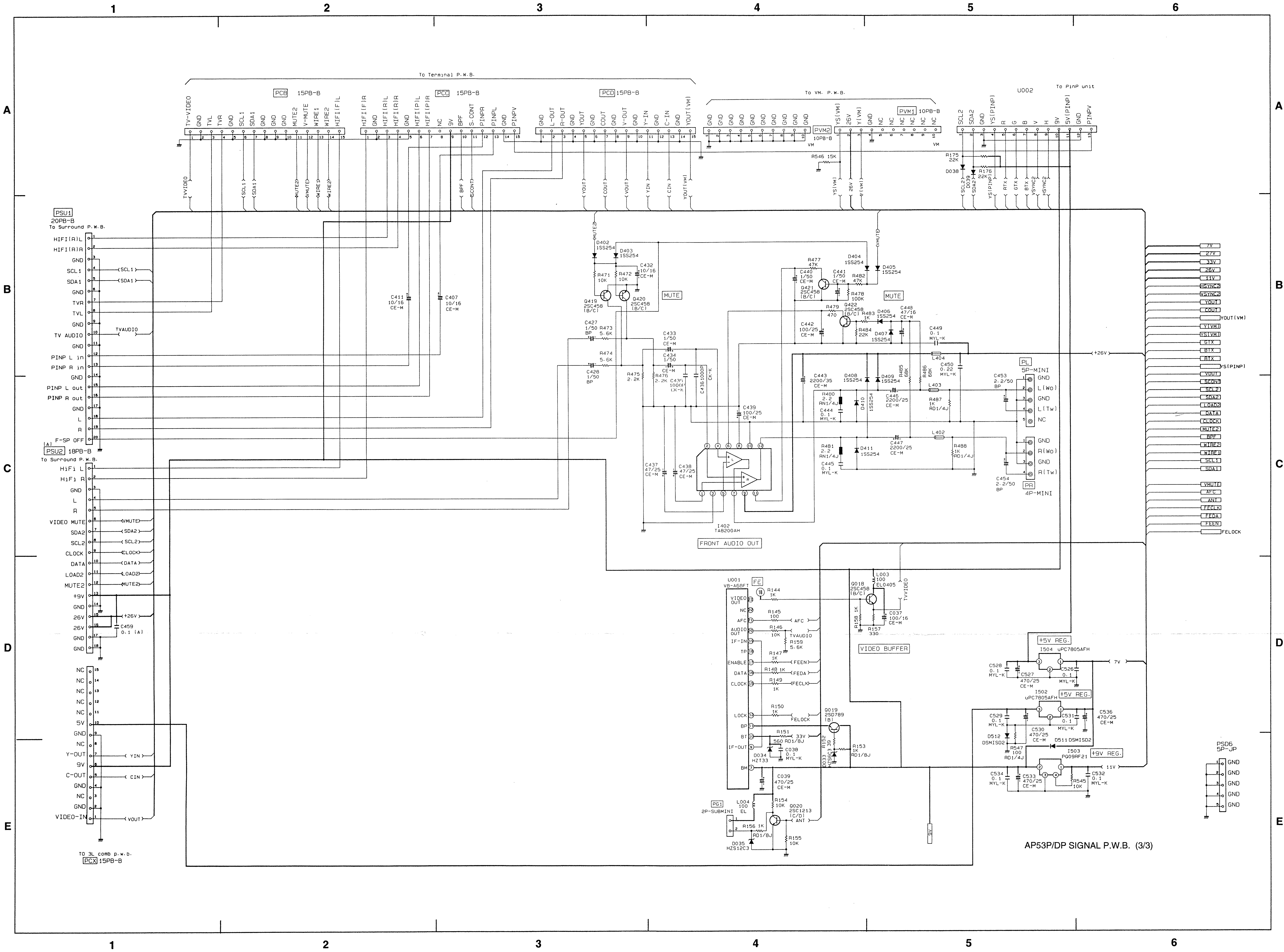

1
2
3
4
5
6
A
B
C
D
E
To Terminal P.W.B.
PCB 15PB-B
PCC 15PB-B
PCD 15PB-B
To VM. P.W.B.
PVM1 10PB-B
PVM2 10PB-B
U002
To PinP unit
PSU1 20PB-B To Surround P.W.B.
PSU2 18PB-B To Surround P.W.B.
TO 3L comb p.w.b. PCX 15PB-B
MUTE
FRONT AUDIO OUT
I402 TA8200AH
PL 5P-MINI
PR 4P-MINI
U001 VB-A68FT
FE
VIDEO BUFFER
+5V REG.
I504 uPC7805AFH
I502 uPC7805AFH
+9V REG.
I503 PQ09RF21
PG1 2P-SUBMINI
PSD6 5P-JP
AP53P/DP SIGNAL P.W.B. (3/3)

Circuit No.	Pin No.	Voltage VDC
I402	1	1.6
	2	0
	3	0
	4	0
	5	1.6
	6	9.1
	7	12.5
	8	5.0
	9	27.1
	10	0
	11	4.1
	12	12.3

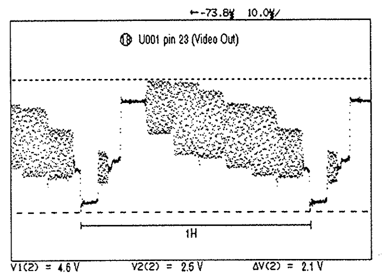
Circuit No.	Pin No.	Voltage VDC
I502	1	8.3
	2	0.3
	3	5.2

Circuit No.	Pin No.	Voltage VDC
I503	1	12.7
	2	9.1
	3	0
	4	12.7

Circuit No.	Pin No.	Voltage VDC
I504	1	8.3
	2	0
	3	4.9

Circuit No.	Pin No.	Voltage VDC
Q419	B	0.2
	C	0
	E	0
Q420	B	0.2
	C	0
	E	0
Q421	B	0
	C	4.1
	E	0
Q422	B	0
	C	9.1
	E	0
Q018	B	1.7
	C	9.0
	E	1.0
Q019	B	6.2
	C	9.0
	E	5.6
Q020	B	0.6
	C	0.1
	E	0

- All DC voltage to be measured with a tester (100kΩ/V). Voltage taken on a complex color bar signal including a standard color bar signal.
- Since this is a basic circuit diagram, the value of the parts is subject to be altered for improvement.



BASIC CIRCUIT DIAGRAM

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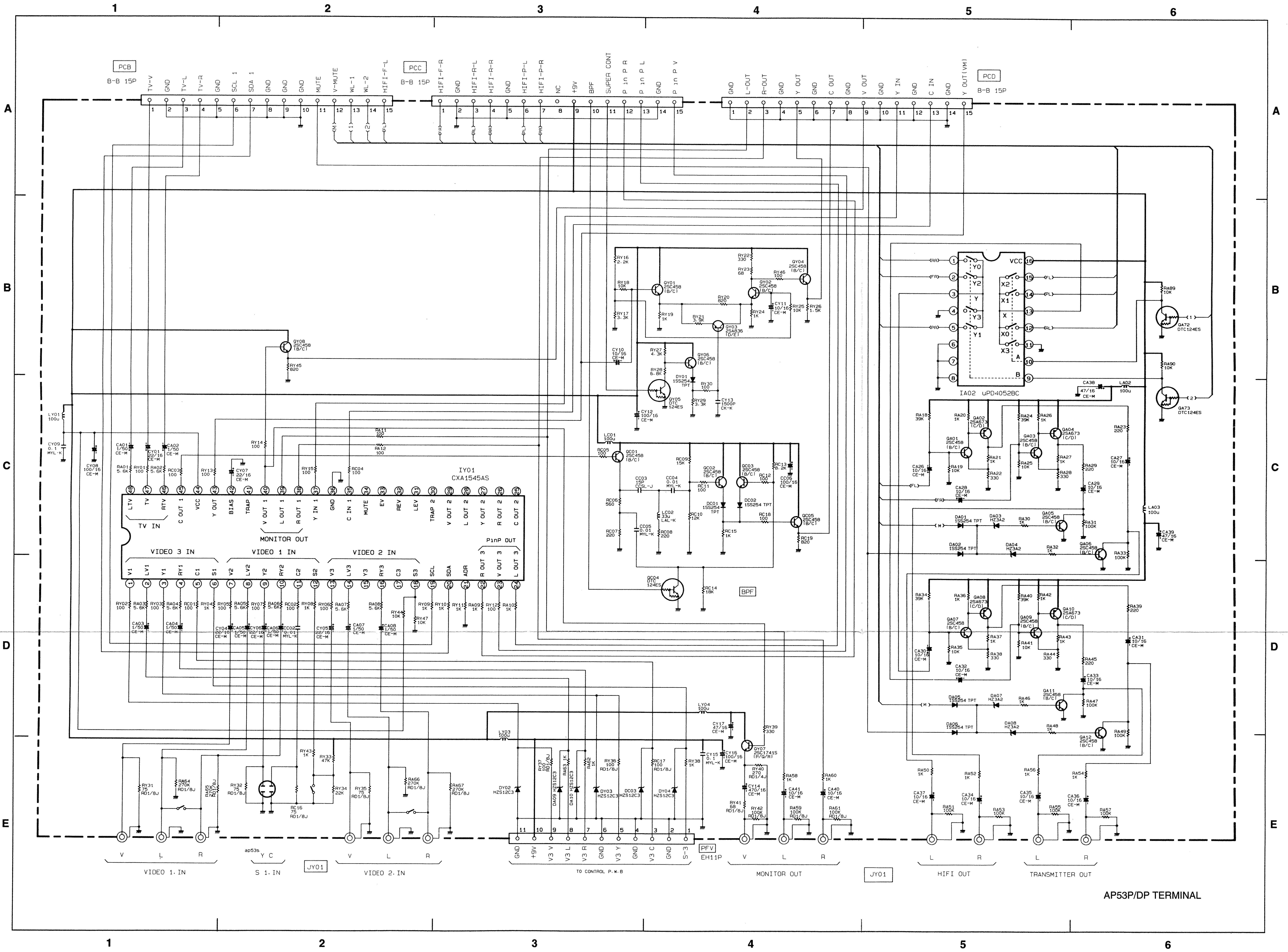
PCB
B-B 15P
PCC
B-B 15P
PCD
B-B 15P
TV-V
GND
TV-L
TV-R
SCL 1
SDA 1
MUTE
V-MUTE
WL-1
WL-2
HIFI-F-L
HIFI-F-R
HIFI-R-L
HIFI-R-R
HIFI-P-L
HIFI-P-R
NC
+9V
BPF
SUPER CONT
P in P R
P in P L
P in P V
L-OUT
R-OUT
Y OUT
C OUT
V OUT
Y IN
C IN
Y OUT(VM)
IY01
CXA1545AS
TV IN
MONITOR OUT
PinP OUT
VIDEO 3 IN
VIDEO 1 IN
VIDEO 2 IN
IA02 uPD4052BC
BPF
PFV
EH11P
VIDEO 1. IN
S 1. IN
VIDEO 2. IN
JY01
TO CONTROL P.W.B
MONITOR OUT
HIFI OUT
TRANSMITTER OUT

AP53P/DP TERMINAL

- All DC voltage to be measured with a tester (100kΩ/V). Voltage taken on a complex color bar signal including a standard color bar signal.
- Since this is a basic circuit diagram, the value of the parts is subject to be altered for improvement.

Circuit No.	Pin No.	Voltage VDC
IA02	1	4.2
	2	4.2
	3	4.2
	4	0
	5	4.2
	6	0
	7	0
	8	0
	9	9.0
	10	0
	11	0
	12	4.2
	13	4.2
	14	4.2
	15	4.2
	16	9.0

Circuit No.	Pin No.	Voltage VDC
IY01	1	4.7
	2	4.7
	3	4.7
	4	4.7
	5	4.7
	6	2.5
	7	4.7
	8	4.7
	9	4.7
	10	4.7
	11	4.7
	12	2.5
	13	4.7
	14	4.7
	15	4.7
	16	4.7
	17	4.7
	18	4.3
	19	5.1
	20	5.1
	21	0
	22	4.8
	23	4.6
	24	4.8

Circuit No.	Pin No.	Voltage VDC
IY01	25	4.7
	26	4.8
	27	4.7
	28	4.8
	29	4.7
	30	4.7
	31	4.7
	32	4.7
	33	4.7
	34	0
	35	4.7
	36	0
	37	4.7
	38	4.8
	39	4.8
	40	4.6
	41	4.7
	42	4.7
	43	4.6
	44	9.0
	45	4.6
	46	4.7
	47	4.7
	48	4.7

Circuit No.	Pin No.	Voltage VDC
QA01	B	1.8
	C	8.4
	E	1.2
QA02	B	8.4
	C	4.1
	E	9.0
QA03	B	1.8
	C	8.4
	E	1.2
QA04	B	8.4
	C	4.0
	E	9.0
QA05	B	0
	C	0
	E	0
QA06	B	0
	C	0
	E	0
QA07	B	1.8
	C	8.4
	E	1.2

Circuit No.	Pin No.	Voltage VDC
QA08	B	8.4
	C	4.0
	E	9.0
QA09	B	1.8
	C	8.4
	E	1.2
QA10	B	8.4
	C	4.1
	E	9.0
QA11	B	0
	C	0
	E	0
QA12	B	0
	C	0
	E	0
QA72	B	5.0
	C	0
	E	0
QA73	B	0
	C	9.0
	E	0

Circuit No.	Pin No.	Voltage VDC
QC01	B	4.6
	C	9.0
	E	3.9
QC02	B	3.9
	C	9.0
	E	3.2
QC03	B	0
	C	9.0
	E	0.1
QC04	B	5.0
	C	0
	E	0
QC05	B	2.6
	C	9.0
	E	1.9

Circuit No.	Pin No.	Voltage VDC
QY01	B	5.1
	C	9.1
	E	4.4
QY02	B	5.0
	C	7.3
	E	4.4
QY03	B	7.7
	C	4.4
	E	4.4
QY04	B	7.3
	C	9.1
	E	6.7
QY05	B	0
	C	9.0
	E	0
QY06	B	9.0
	C	9.1
	E	8.3
QY07	B	4.6
	C	9.0
	E	4.0
QY08	B	4.6
	C	9.0
	E	3.9

BASIC CIRCUIT DIAGRAM

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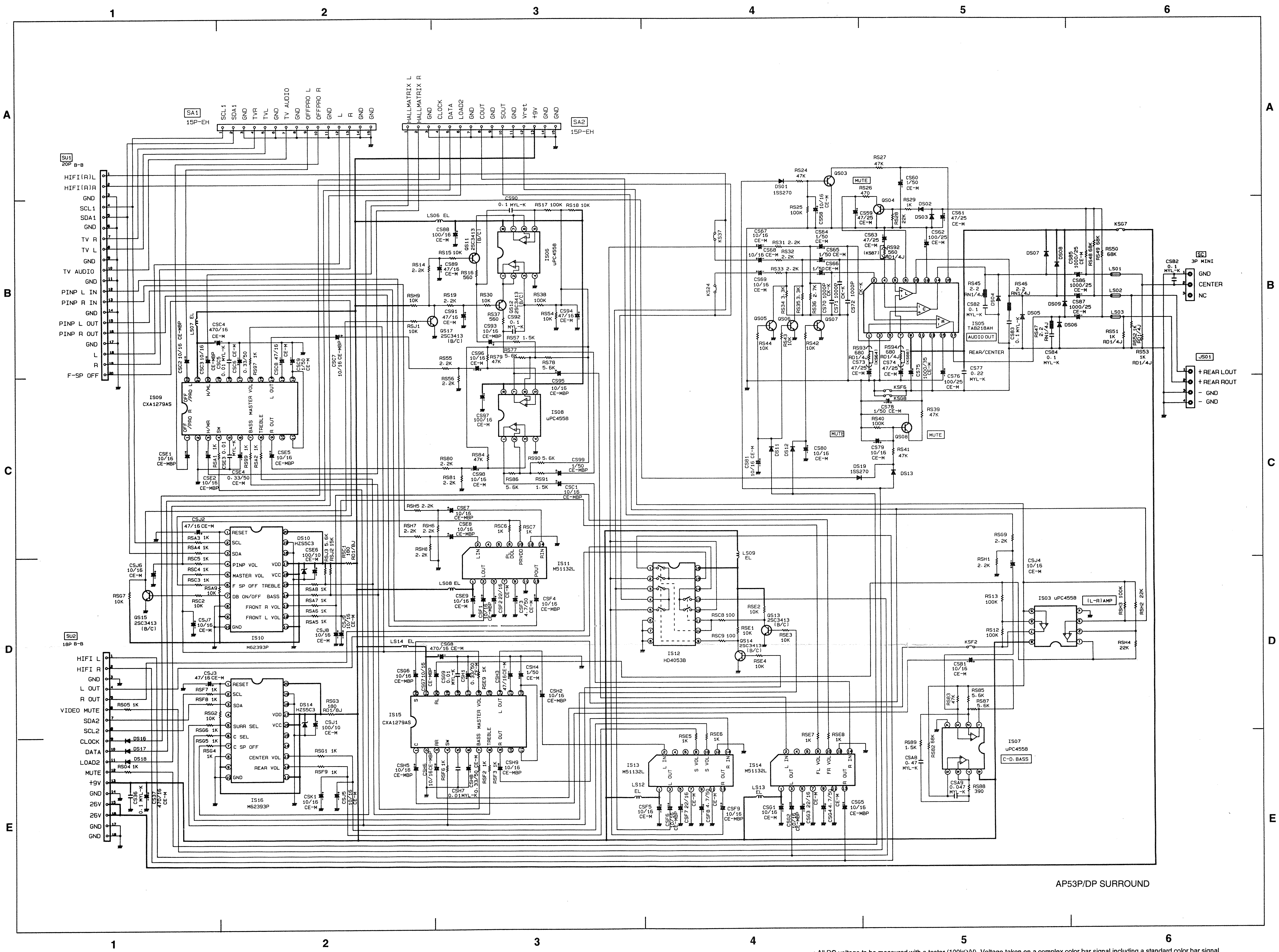
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A
B
C
D
E
SA1
15P-EH
SA2
15P-EH
SU1
20P B-B
HIFI(R)L
HIFI(R)R
GND
SCL1
SDA1
TV R
TV L
TV AUDIO
PINP L IN
PINP R IN
PINP L OUT
PINP R OUT
L
R
F-SP OFF
SU2
18P B-B
HIFI L
HIFI R
L OUT
R OUT
VIDEO MUTE
SDA2
SCL2
CLOCK
DATA
LOAD2
MUTE
+9V
26V
HALLMATRIX L
HALLMATRIX R
OFFPRO L
OFFPRO R
Vret
IS03 uPC4558
IL-R1AMP
IS05 TA8218AH
AUDIO OUT
REAR/CENTER
IS06 uPC4558
IS07 uPC4558
C-D.BASS
IS08 uPC4558
IS09 CXA1279AS
IS10 M62393P
IS11 M51132L
IS12 HD4053B
IS13 M51132L
IS14 M51132L
IS15 CXA1279AS
IS16 M62393P
SC 3P MINI
CENTER
NC
JS01
+ REAR LOUT
+ REAR ROUT
- GND
MUTE
AP53P/DP SURROUND

- All DC voltage to be measured with a tester (100kΩ/V). Voltage taken on a complex color bar signal including a standard color bar signal.
- Since this is a basic circuit diagram, the value of the parts is subject to be altered for improvement.

Circuit No.	Pin No.	Voltage VDC
IS03	1	4.5
	2	4.5
	3	4.5
	4	0
	5	4.5
	6	4.5
	7	4.5
	8	9.0

Circuit No.	Pin No.	Voltage VDC
IS05	1	1.9
	2	2.1
	3	0
	4	1.9
	5	2.1
	6	2.1
	7	1.9
	8	9.2
	9	27.1
	10	13.2
	11	2.1
	12	2.8
	13	0
	14	13.3
	15	5.1
	16	4.3
	17	12.9

Circuit No.	Pin No.	Voltage VDC
IS06	1	4.5
	2	4.5
	3	4.5
	4	0
	5	4.5
	6	4.5
	7	4.5
	8	9.0

Circuit No.	Pin No.	Voltage VDC
IS07	1	4.6
	2	4.6
	3	4.5
	4	0
	5	4.5
	6	4.5
	7	4.5
	8	9.0

Circuit No.	Pin No.	Voltage VDC
IS08	1	4.5
	2	4.5
	3	4.5
	4	0
	5	4.5
	6	4.5
	7	4.5
	8	9.0

Circuit No.	Pin No.	Voltage VDC
IS09	1	4.5
	2	0
	3	4.5
	4	3.0
	5	4.6
	6	4.6
	7	4.1
	8	3.6
	9	4.5
	10	0
	11	2.5
	12	2.5
	13	4.5
	14	4.5
	15	2.6
	16	0.9
	17	4.6
	18	4.6
	19	0
	20	4.5
	21	9
	22	4.5

Circuit No.	Pin No.	Voltage VDC
IS10	1	5.3
	2	5.1
	3	5.1
	4	5.2
	5	0.9
	6	0
	7	4.7
	8	0
	9	5.3
	10	0
	11	5.3
	12	5.1
	13	5.1
	14	4.1
	15	3.3
	16	5.3
	17	5.3
	18	0
	19	0
	20	5.3

Circuit No.	Pin No.	Voltage VDC
IS11	1	9.0
	2	3.9
	3	3.5
	4	5.6
	5	8.9
	6	0
	7	0
	8	5.2
	9	0
	10	5.2
	11	0
	12	0
	13	3.5
	14	3.8

Circuit No.	Pin No.	Voltage VDC
IS12	1	2.3
	2	2.9
	3	2.7
	4	2.8
	5	2.8
	6	0
	7	0
	8	0
	9	0
	10	9.0
	11	9.0
	12	2.7
	13	2.3
	14	2.3
	15	2.3
	16	9.0

Circuit No.	Pin No.	Voltage VDC
IS13	1	9.0
	2	3.9
	3	3.5
	4	5.6
	5	8.8
	6	0
	7	0
	8	4.8
	9	0
	10	4.8
	11	0
	12	0
	13	3.5
	14	3.8

Circuit No.	Pin No.	Voltage VDC
IS14	1	9.0
	2	3.9
	3	3.5
	4	5.5
	5	8.8
	6	0
	7	0
	8	5.1
	9	0
	10	5.1
	11	0
	12	0
	13	3.5
	14	3.8

Circuit No.	Pin No.	Voltage VDC
IS15	1	4.5
	2	0
	3	4.5
	4	2.9
	5	4.6
	6	4.6
	7	4.1
	8	3.6
	9	4.5
	10	0
	11	2.5
	12	2.5
	13	4.5
	14	4.5
	15	2.6
	16	0.8
	17	4.6
	18	4.6
	19	0
	20	4.5
	21	9
	22	4.5

Circuit No.	Pin No.	Voltage VDC
IS16	1	5.3
	2	5.1
	3	5.1
	4	0
	5	5.1
	6	0
	7	5.3
	8	0
	9	5.3
	10	0
	11	5.3
	12	4.8
	13	4.8
	14	0
	15	0
	16	5.3
	17	5.3
	18	0
	19	0
	20	5.3

Circuit No.	Pin No.	Voltage VDC
QS03	B	0
	C	4.3
	E	0
QS04	B	0
	C	9.2
	E	0
QS05	B	0.3
	C	0
	E	0
QS06	B	0.2
	C	0
	E	0
QS07	B	0.3
	C	0
	E	0
QS08	B	0.6
	C	0
	E	0
QS11	B	5.1
	C	4.5
	E	4.5
QS12	B	5.1
	C	4.5
	E	4.5

Circuit No.	Pin No.	Voltage VDC
QS13	B	0
	C	9.0
	E	0
QS14	B	0.7
	C	0
	E	0
QS15	B	0.8
	C	0
	E	0
QS17	B	0
	C	6.6
	E	0

BASIC CIRCUIT DIAGRAM

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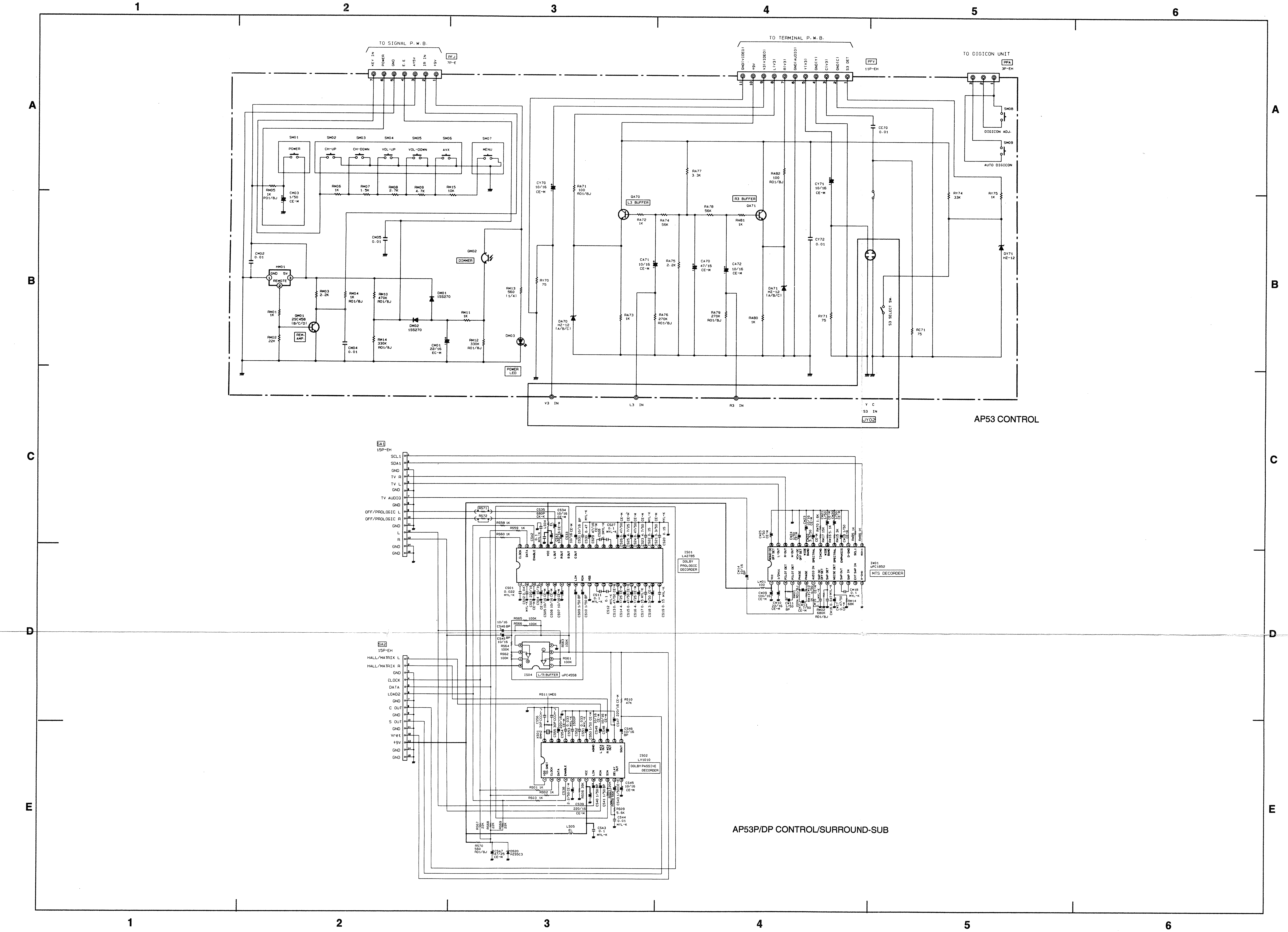
1
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A
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D
E
TO SIGNAL P.W.B.
TO TERMINAL P.W.B.
TO DIGICON UNIT
SM01 POWER
SM02 CH-UP
SM03 CH-DOWN
SM04 VOL-UP
SM05 VOL-DOWN
SM06 AVX
SM07 MENU
SM08 DIGICON ADJ.
SM09 AUTO DIGICON
REMOTE
REM AMP
DIMMER
POWER LED
L3 BUFFER
R3 BUFFER
S3 SELECT SW.
Y3 IN
L3 IN
R3 IN
S3 IN
AP53 CONTROL
IS01 LA2785 DOLBY PROLOGIC DECORDER
IS04 L/R BUFFER uPC4558
IS02 LV1010 DOLBY PASSIVE DECORDER
IW01 uPC1852 MTS DECORDER
AP53P/DP CONTROL/SURROUND-SUB

- All DC voltage to be measured with a tester (100kΩ/V). Voltage taken on a complex color bar signal including a standard color bar signal.
- Since this is a basic circuit diagram, the value of the parts is subject to be altered for improvement.

Circuit No.	Pin No.	Voltage VDC
IS01	1	4.6
	2	4.6
	3	4.5
	4	4.5
	5	4.5
	6	4.5
	7	4.5
	8	4.5
	9	4.5
	10	4.5
	11	0
	12	4.5
	13	4.5
	14	4.5
	15	4.5
	16	5.3
	17	4.5
	18	5.3
	19	5.0
	20	5.0
	21	5.0

Circuit No.	Pin No.	Voltage VDC
IS01	22	4.3
	23	4.3
	24	4.3
	25	5.3
	26	4.5
	27	5.3
	28	4.5
	29	4.5
	30	4.5
	31	4.5
	32	4.5
	33	4.5
	34	4.5
	35	4.5
	36	4.5
	37	4.5
	38	9.0
	39	0.1
	40	5.2
	41	5.2
	42	5.2

Circuit No.	Pin No.	Voltage VDC
IS02	1	0
	2	5.1
	3	5.1
	4	5.2
	5	2.2
	6	0.7
	7	9.0
	8	4.5
	9	4.5
	10	4.5
	11	4.5
	12	4.5
	13	4.5
	14	4.5
	15	4.5
	16	4.5
	17	0
	18	4.5
	19	4.5
	20	4.5
	21	4.5
	22	4.7
	23	2.3
	24	2.3

Circuit No.	Pin No.	Voltage VDC
IS04	1	4.5
	2	4.5
	3	4.5
	4	0
	5	4.5
	6	4.5
	7	4.5
	8	9.0

Circuit No.	Pin No.	Voltage VDC
IW01	1	9.0
	2	4.5
	3	4.5
	4	4.6
	5	4.6
	6	4.6
	7	4.5
	8	4.5
	9	5.6
	10	0.1
	11	3.4
	12	4.5
	13	4.5
	14	0
	15	5.1
	16	5.1
	17	0
	18	4.7
	19	4.6
	20	4.7
	21	1.2
	22	5.1
	23	5.2
	24	4.5
	25	4.6
	26	4.6
	27	4.6
	28	4.8

Circuit No.	Pin No.	Voltage VDC
QM01	B	0.7
	C	0.1
	E	0
QM02	B	---
	C	1.6
	E	9.1
QA70	B	2.7
	C	9.0
	E	2.0
QA71	B	2.7
	C	9.0
	E	2.1

BASIC CIRCUIT DIAGRAM

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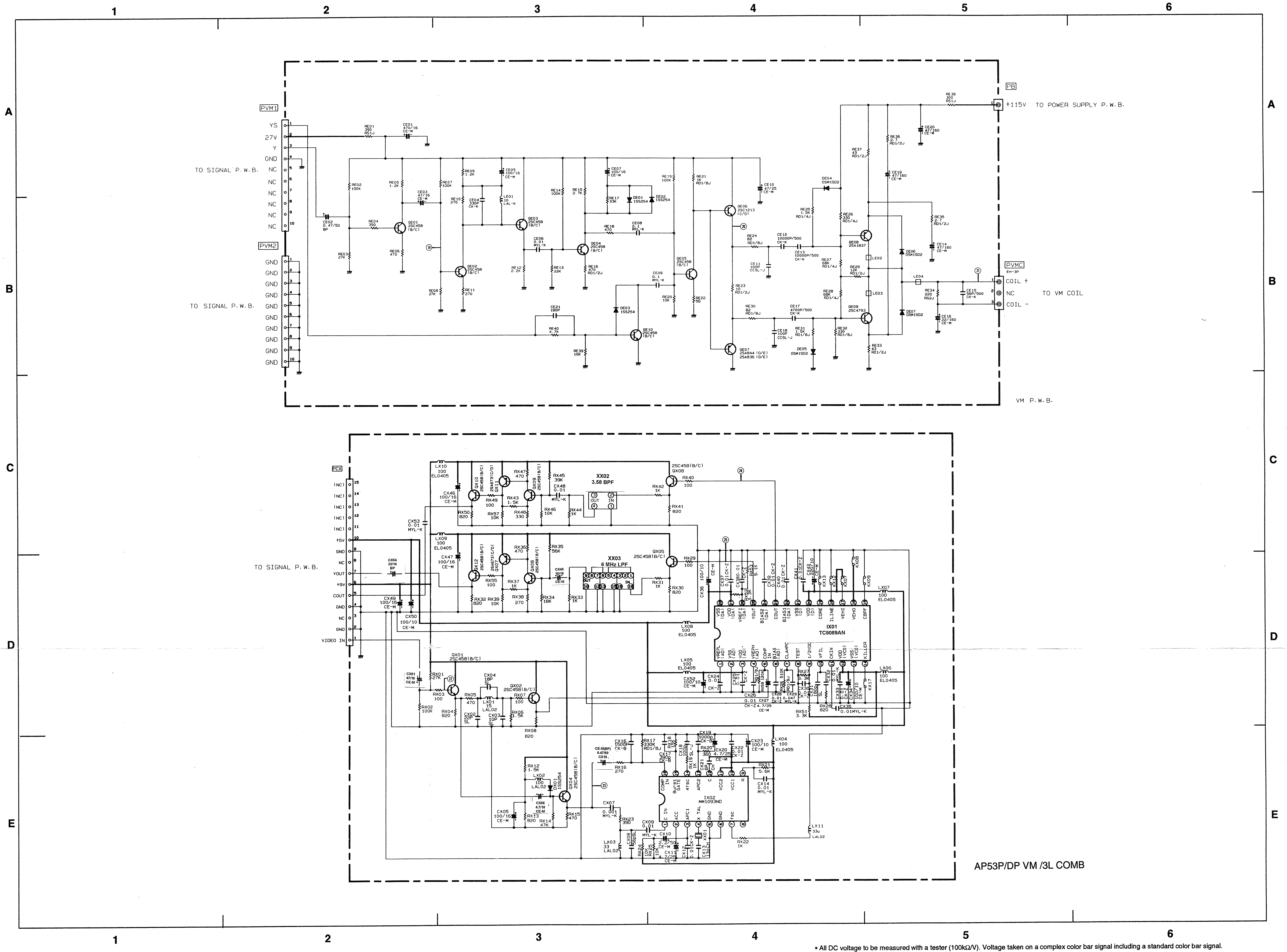
1
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A
B
C
D
E
PVM1
YS
27V
Y
GND
NC
TO SIGNAL P.W.B.
PVM2
GND
TO SIGNAL P.W.B.
PB
+115V TO POWER SUPPLY P.W.B.
PVMC
COIL +
NC
COIL −
TO VM COIL
VM P.W.B.
PCX
(NC)
+5V
GND
NC
YOUT
+9V
COUT
VIDEO IN
TO SIGNAL P.W.B.
XX02 3.58 BPF
XX03 6 MHz LPF
IX01 TC9089AN
IX02 MM1093ND
AP53P/DP VM /3L COMB

- All DC voltage to be measured with a tester (100kΩ/V). Voltage taken on a complex color bar signal including a standard color bar signal.
- Since this is a basic circuit diagram, the value of the parts is subject to be altered for improvement.

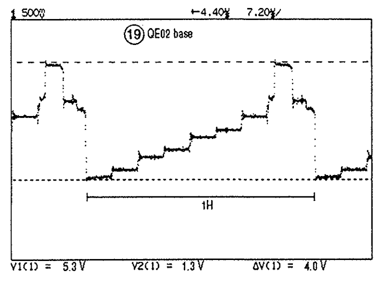
Circuit No.	Pin No.	Voltage VDC
IX01	1	1.6
	2	0
	3	5.2
	4	3.6
	5	2.3
	6	1.4
	7	3.3
	8	0
	9	2.6
	10	2.1
	11	2.4
	12	5.2
	13	0
	14	0
	15	0
	16	0
	17	5.2
	18	0
	19	0
	20	5.2
	21	0
	22	3.6
	23	4.5
	24	1.9
	25	4.3
	26	3.8
	27	5.2
	28	0

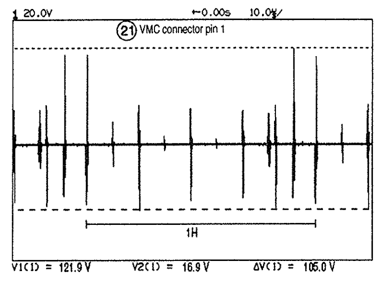
Circuit No.	Pin No.	Voltage VDC
IX02	1	3.7
	2	0.8
	3	2.6
	4	3.5
	5	0
	6	0
	7	2.5
	8	0
	9	3.6
	10	5.1
	11	5.1
	12	3.5
	13	2.1
	14	3.3
	15	0.8
	16	2.8

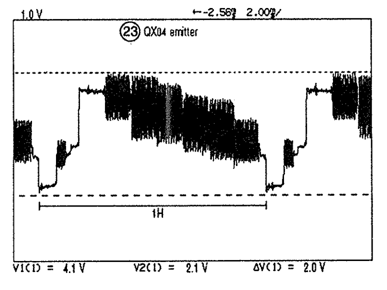
Circuit No.	Pin No.	Voltage VDC
QX01	B	6.4
	C	9.1
	E	5.5
QX02	B	4.3
	C	9.1
	E	3.6
QX04	B	3.5
	C	9.1
	E	2.8
QX05	B	4.3
	C	9.0
	E	3.6
QX06	B	2.1
	C	8.4
	E	1.4
QX07	B	8.4
	C	5.4
	E	9.0

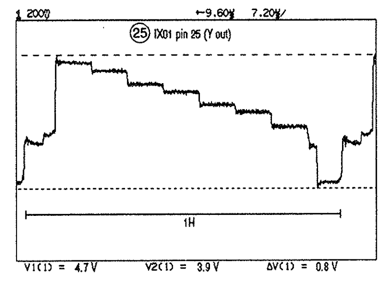
Circuit No.	Pin No.	Voltage VDC
QX08	B	4.5
	C	9.0
	E	3.8
QX09	B	1.8
	C	8.4
	E	1.2
QX10	B	4.4
	C	9.0
	E	3.7
QX11	B	8.4
	C	4.5
	E	9.0
QX12	B	5.4
	C	9.0
	E	4.7

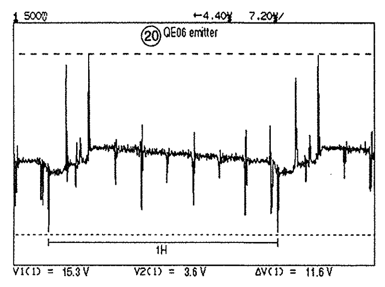
Circuit No.	Pin No.	Voltage VDC
QE01	B	2.8
	C	9.9
	E	2.2
QE02	B	2.6
	C	6.8
	E	1.9
QE03	B	6.8
	C	15.4
	E	6.1
QE04	B	2.4
	C	5.6
	E	1.7
QE05	B	1.1
	C	8.0
	E	0.4
QE06	B	7.9
	C	15.4
	E	8.0
QE07	B	8.0
	C	0
	E	8.0
QE08	B	112.4
	C	39.9
	E	112.5
QE09	B	0.2
	C	38.3
	E	0.2
QE10	B	0
	C	0
	E	0

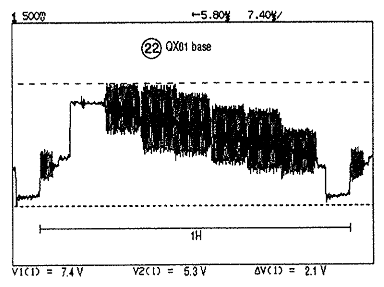


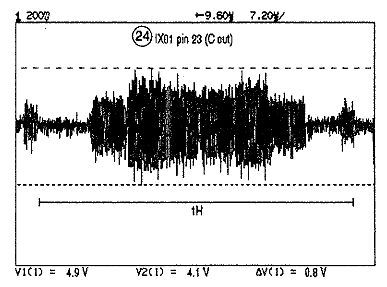












BASIC CIRCUIT DIAGRAM

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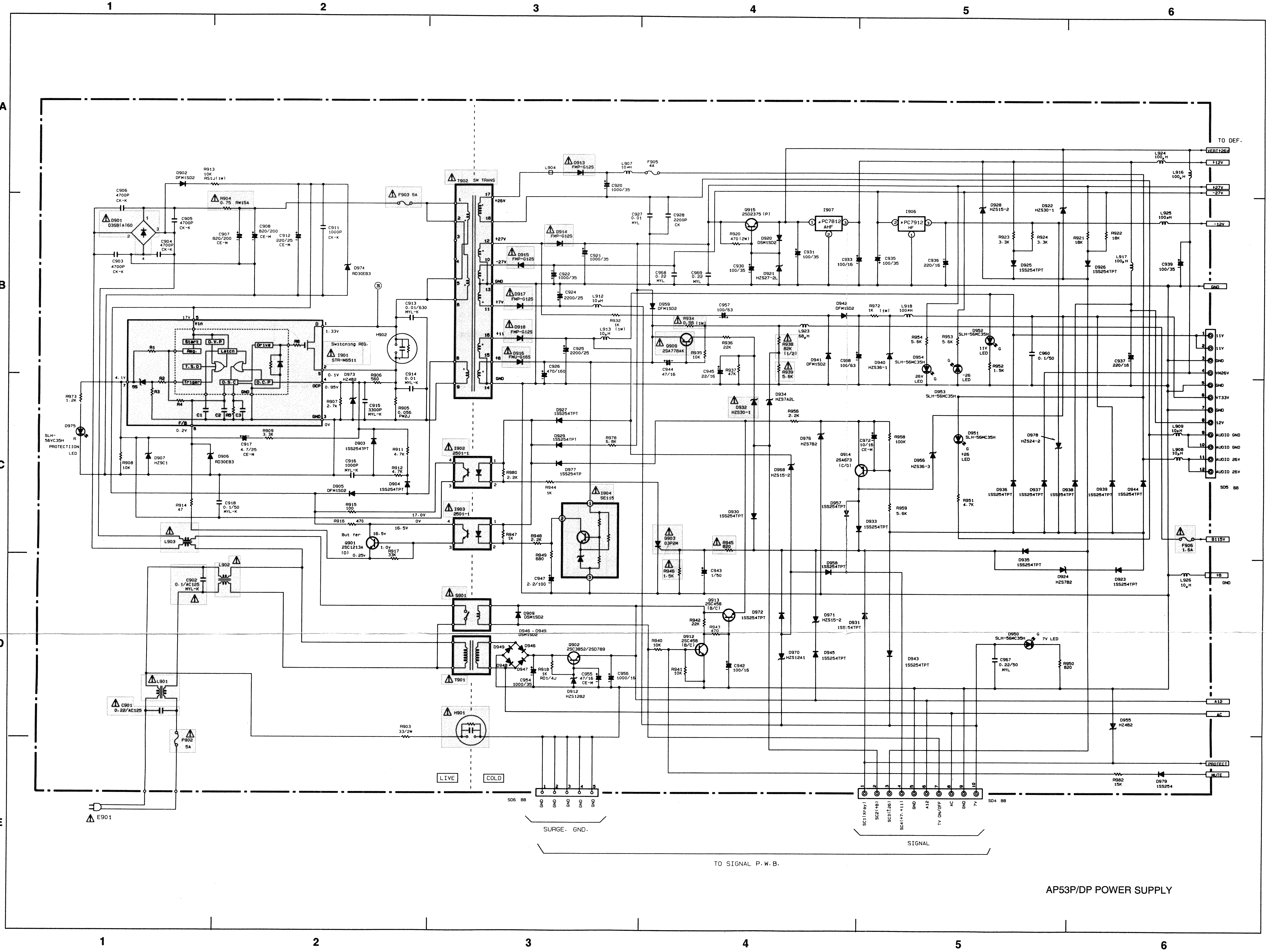

1
2
3
4
5
6
A
B
C
D
E
TO DEF.
VERT+26V
F12V
+27V
-27V
-12V
GND
11V
11V
GND
VH26V
GND
VT33V
GND
12V
AUDIO GND
AUDIO GND
AUDIO 26V
AUDIO 26V
SO5 BB
B115V
HB
GND
A12
AC
PROTECT
MUTE
T902 SW TRANS
I901 STR-M6511
Switching REG.
I906 PC7912
I907 PC7812
LIVE
COLD
E901
SO6 BB
SO4 BB
SURGE. GND.
SIGNAL
TO SIGNAL P.W.B.

AP53P/DP POWER SUPPLY

- All DC voltage to be measured with a tester (100kΩ/V). Voltage taken on a complex color bar signal including a standard color bar signal.
- Since this is a basic circuit diagram, the value of the parts is subject to be altered for improvement.

Circuit No.	Pin No.	Voltage VDC
I901	1	1.33
	2	0.1
	3	0
	4	0.95
	5	17.0
	6	0.2
	7	4.1

Circuit No.	Pin No.	Voltage VDC
I902	1	20.0
	2	20.0
	3	17.0
	4	0

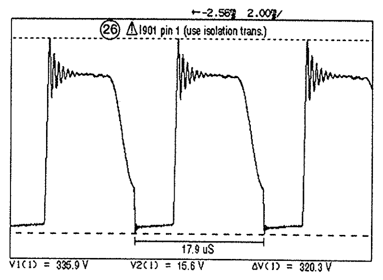
Circuit No.	Pin No.	Voltage VDC
I903	1	20.0
	2	19.1
	3	16.5
	4	1.0

Circuit No.	Pin No.	Voltage VDC
I904	1	115.1
	2	17.0
	3	0

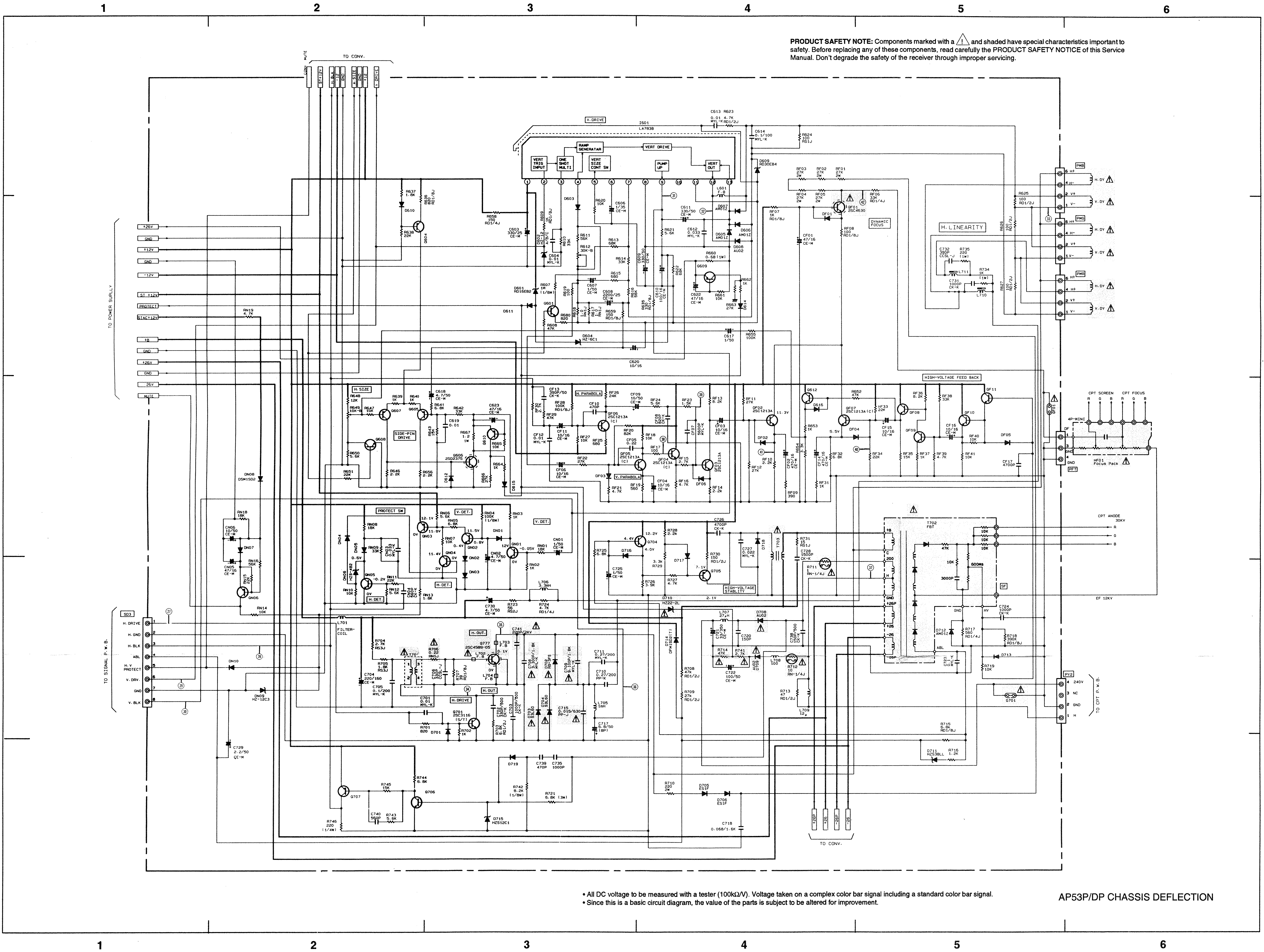
Circuit No.	Pin No.	Voltage VDC
I906	1	0
	2	-26.8
	3	-12.2

Circuit No.	Pin No.	Voltage VDC
I907	1	25.8
	2	0
	3	11.8

Circuit No.	Pin No.	Voltage VDC
Q901	B	1.0
	C	16.5
	E	0.25
Q902	B	12.9
	C	18.1
	E	12.4
Q903	K	0
	A	20.0
	G	0.1
Q909	B	65.0
	C	0.1
	E	115.1
Q912	B	0.1
	C	12.2
	E	0
Q913	B	0.1
	C	12.4
	E	11.6
Q914	B	6.7
	C	0
	E	7.0
Q915	B	26.5
	C	27.1
	E	25.9



BASIC CIRCUIT DIAGRAM


TO CONV.
MUTE
V.DRIVE
I601
LA7838
VERT TRIG INPUT
ONE SHOT MULTI
RAMP GENERATOR
VERT SIZE CONT SW
VERT DRIVE
PUMP UP
VERT OUT
DYNAMIC FOCUS
H.LINEARITY
TO POWER SUPPLY
+26V
GND
+12V
-12V
ST +12V
PROTECT
STBY+12V
+B
25V
H.SIZE
SIDE-PIN DRIVE
H.PARABOLA
V.PARABOLA
HIGH-VOLTAGE FEED BACK
HIGH-VOLTAGE STABILITY
PROTECT SW
V.DET.
H.DET.
CPT SCREEN
CPT FOCUS
Focus Pack
CPT ANODE 30KV
T702 FBT
EF 12KV
H.OUT.
H.DRIVE
FILTER-COIL
TO SIGNAL P.W.B.
H.DRIVE
H.GND
H.BLK
ABL
H.V PROTECT
V.DRV.
GND
V.BLK
TO CPT P.W.B.
240V
NC
GND
H
H.DY
V.DY
TO CONV.

PRODUCT SAFETY NOTE: Components marked with a ⚠ and shaded have special characteristics important to safety. Before replacing any of these components, read carefully the PRODUCT SAFETY NOTICE of this Service Manual. Don't degrade the safety of the receiver through improper servicing.

- All DC voltage to be measured with a tester (100kΩ/V). Voltage taken on a complex color bar signal including a standard color bar signal.
- Since this is a basic circuit diagram, the value of the parts is subject to be altered for improvement.

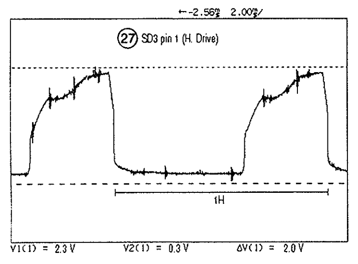
AP53P/DP CHASSIS DEFLECTION

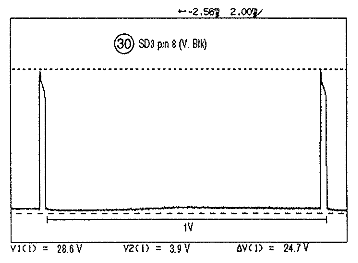
Circuit No.	Pin No.	Voltage VDC
I601	1	10.9
	2	4.4
	3	5.4
	4	5.6
	5	0
	6	5.1
	7	5.6
	8	25.6
	9	1.6
	10	1.3
	11	0
	12	13.0
	13	25.3

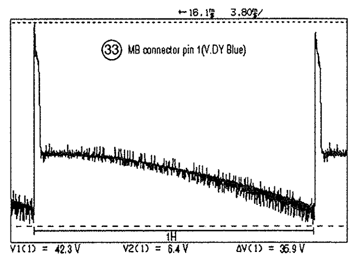
Circuit No.	Pin No.	Voltage VDC
Q607	B	5.3
	C	0.5
	E	5.9
Q608	B	0
	C	2.4
	E	0
Q609	B	0
	C	0
	E	25.9
Q610	B	15.4
	C	0
	E	15.7
Q612	B	4.2
	C	11.7
	E	3.6
Q701	B	0.3
	C	35.0
	E	0
Q704	B	4.4
	C	11.7
	E	3.8
Q705	B	6.0
	C	2.3
	E	6.7
Q706	B	-0.4
	C	9.5
	E	0
Q707	B	12.7
	C	2.3
	E	11.7
Q777	B	0
	C	113.3
	E	0

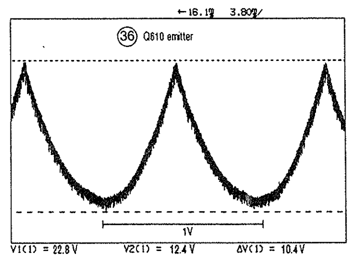
Circuit No.	Pin No.	Voltage VDC
QF01	B	11.6
	C	617.8
	E	11.1
QF02	B	5.9
	C	10.8
	E	5.6
QF03	B	2.5
	C	4.7
	E	1.9
QF04	B	3.1
	C	11.7
	E	2.5
QF05	B	1.1
	C	3.1
	E	0.5
QF06	B	-11.1
	C	-5.2
	E	-11.6
QF07	B	5.8
	C	10.8
	E	5.3
QF08	B	5.0
	C	11.7
	E	4.4
QF09	B	1.5
	C	5.0
	E	0.8
QF10	B	10.5
	C	11.7
	E	9.9
QF11	B	10.9
	C	11.7
	E	10.5

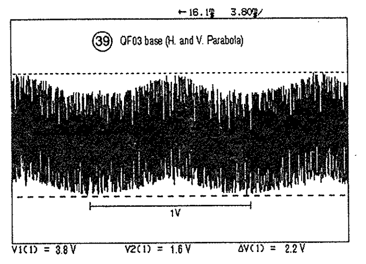
Circuit No.	Pin No.	Voltage VDC
QN01	B	0
	C	11.5
	E	0
QN02	B	0.9
	C	12.4
	E	0.5
QN03	B	12.4
	C	-0.5
	E	12.4
QN04	B	0
	C	12.4
	E	0
QN05	B	-0.2
	C	0.6
	E	0
QN06	B	10.0
	C	-0.5
	E	10.1
Q601	B	0
	C	4.7
	E	0
Q604	B	10.3
	C	6.2
	E	10.9
Q605	B	5.0
	C	1.4
	E	5.6
Q606	B	0.5
	C	15.4
	E	0

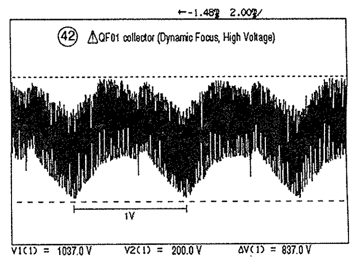


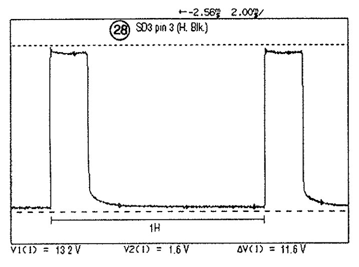


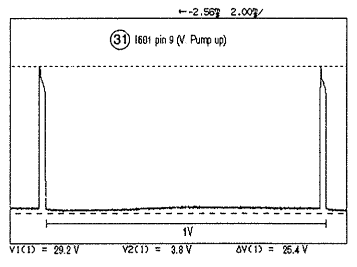


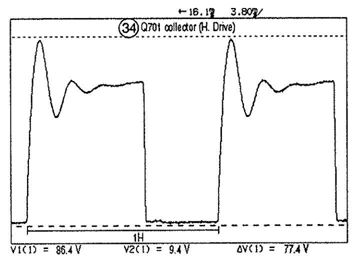


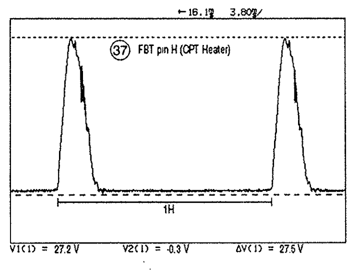


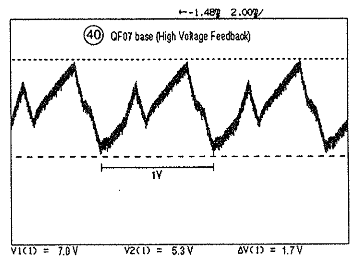


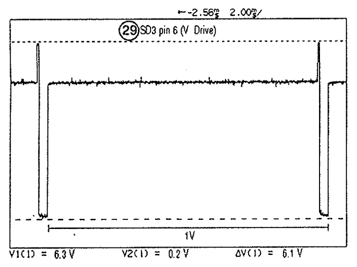


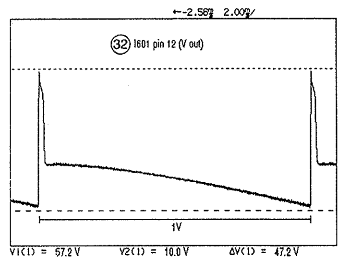


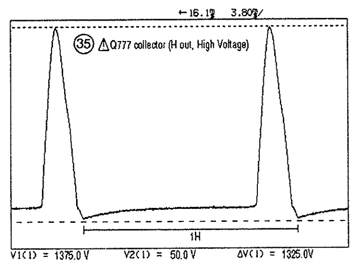


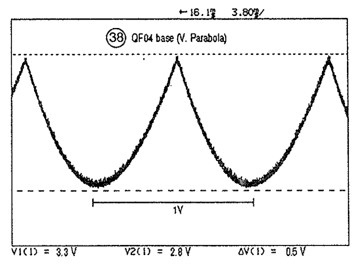


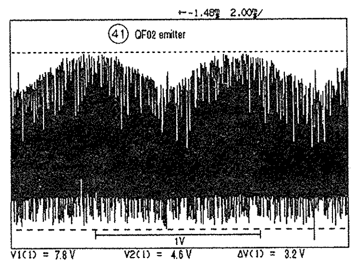






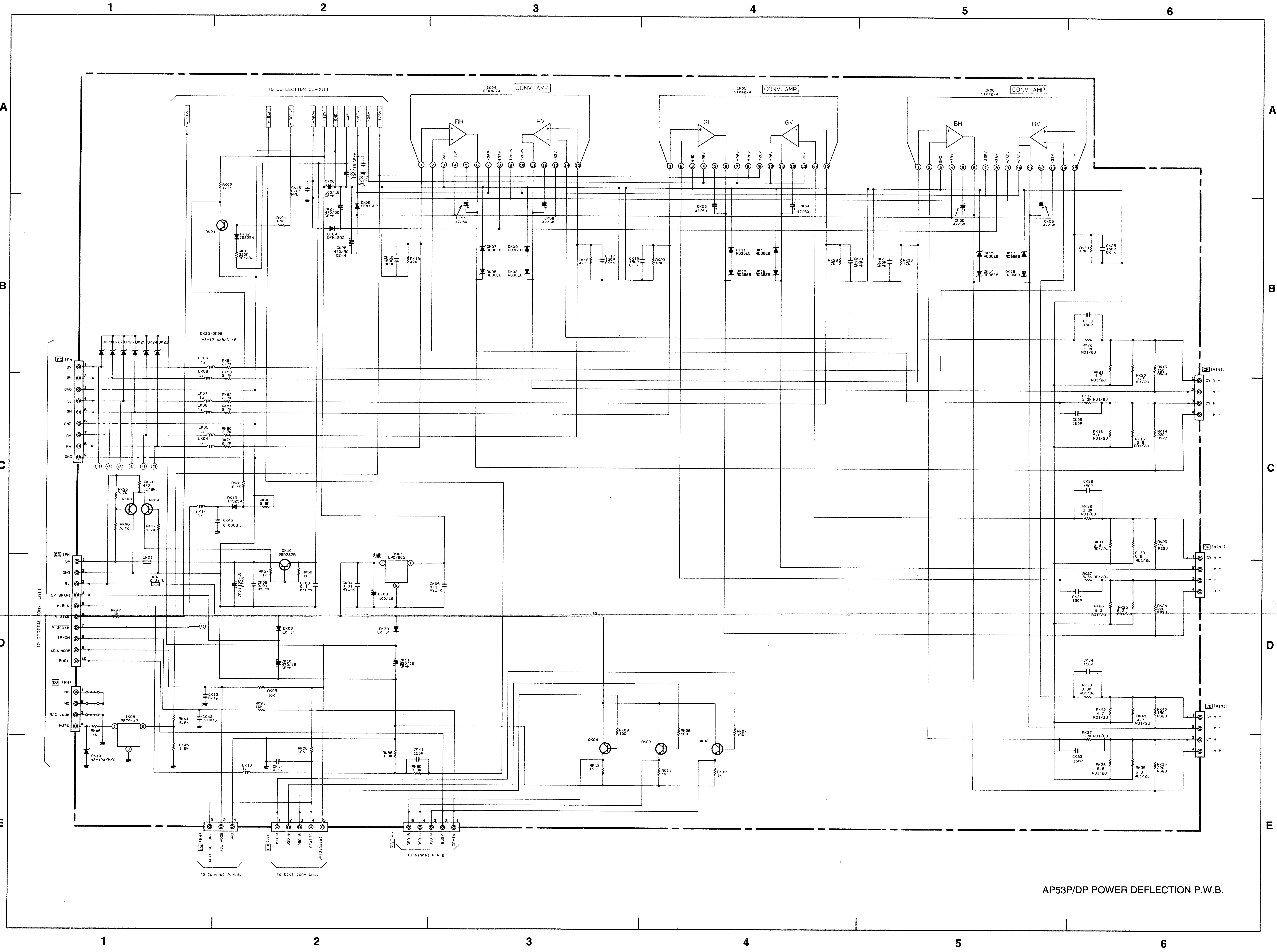






BASIC CIRCUIT DIAGRAM

PRODUCT SAFETY NOTE: Components marked with a ⚠ and shaded have special characteristics important to safety. Before replacing any of these components, read carefully the PRODUCT SAFETY NOTICE of this Service Manual. Don't degrade the safety of the receiver through improper servicing.


1
2
3
4
5
6
A
B
C
D
E
TO DEFLECTION CIRCUIT
A.SIZE
H.BLK
V.DRIVE
+26PV
+12V
GND
-12V
-26PV
-26V
+26V
IK04 STK4274
CONV. AMP
RH
RV
IK05 STK4274
GH
GV
IK06 STK4274
BH
BV
QK01
RK01 47K
RK02 4.7K
RK03 330K RD1/8J
DK32 1SS254
CK46 0.01 MYL
CK06 100/16 CE-M
CK07 100/16 CE-M
CK47 0.01 MYL
CK27 470/50 CE-M
CK28 470/50 CE-M
DK04 DFM1SD2
DK05 DFM1SD2
CK51 47/50
CK52 47/50
CK53 47/50
CK54 47/50
CK55 47/50
CK56 47/50
DK06 RD36EB
DK07 RD36EB
DK08 RD36EB
DK09 RD36EB
CK15 150P CK-K
RK13 47K
RK18 47K
CK17 150P CK-K
RK39 47K
CK25 150P CK-K
DK23-DK28
HZ-12 A/B/C x6
DK28
DK27
DK26
DK25
DK24
DK23
DC (PH)
BV
BH
GND
GV
GH
GND
RV
RH
GND
LK09 1μ
RK84 2.7K
LK08 1μ
RK83 2.7K
LK07 1μ
RK82 2.7K
LK06 1μ
RK81 2.7K
LK05 1μ
RK80 2.7K
LK04 1μ
RK79 2.7K
(44)
(45)
(46)
(47)
(48)
(49)
RK94 470 (1/8W)
RK95 2.7K
QK08
QK09
RK96 2.7K
RK97 1.2K
RK89 2.7K
DK19 1SS254
RK90 6.8K
LK11 1μ
CK45 0.0068μ
TO DIGITAL CONV. UNIT
DG (PH)
-5V
GND
5V
5V(SRAM)
H.BLK
A.SIZE
V.drive
IR-IN
ADJ.MODE
BUSY
LK01
LK02 2.3μFB
RKA7 1K
(43)
QK10 2SD2375
RK57 1K
RK58 1K
CK01 100/16 CE-M
CK02 0.01 MYL-K
CK08 0.1 MYL-K
IK02 UPC7805
CK04 0.01 MYL-K
CK03 100/16
CK05 0.1 MYL-K
DK03 EK-14
DK39 EK-14
CK10 470/16 CE-M
CK11 220/16 CE-M
DD (PH)
NC
NC
R/C code
MUTE
RKA6 1K
DK40 HZ-12A/B/C
IK08 PST9142
RKA4 6.8K
RKA5 1.8K
CK13 0.1μ
CK42 0.001μ
RK05 10K
RK91 10K
RK06 10K
CK14 0.1μ
LK10 1μ
RK86 3.3K
CK41 150P
RK85 3.9K
QK04
QK03
QK02
RK09 100
RK08 100
RK07 100
RK12 1K
RK11 1K
RK10 1K
PA (EH)
AUTO SET UP.
AdJ.MODE
GND
TO Control P.W.B.
DH (PH)
OSD R
OSD G
OSD B
STATIC
5V(digital)
To Digt.Conv.Unit
SD1 5P
OSD B
OSD G
OSD R
BUSY
IR-IN
TO signal P.W.B.
CK30 150P
RK22 3.3K RD1/8J
RK21 4.7 RD1/2J
RK20 4.7 RD1/2J
RK19 150 RS2J
RK17 3.3K RD1/8J
CK29 150P
RK16 5.6 RD1/2J
RK15 5.6 RD1/2J
RK14 220 RS2J
CR (MINI)
CY V -
V +
CY H -
H +
CK32 150P
RK32 3.3K RD1/8J
RK31 6.8 RD1/2J
RK30 6.8 RD1/2J
RK29 150 RS2J
RK27 3.3K RD1/8J
CK31 150P
RK26 8.2 RD1/2J
RK25 8.2 RD1/2J
RK24 220 RS2J
CG (MINI)
CK34 150P
RK38 3.3K RD1/8J
RK42 4.7 RD1/2J
RK41 4.7 RD1/2J
RK40 150 RS2J
RK37 3.3K RD1/8J
CK33 150P
RK36 6.8 RD1/2J
RK35 6.8 RD1/2J
RK34 220 RS2J
CB (MINI)

AP53P/DP POWER DEFLECTION P.W.B.

- All DC voltage to be measured with a tester (100kΩ/V). Voltage taken on a complex color bar signal including a standard color bar signal.
- Since this is a basic circuit diagram, the value of the parts is subject to be altered for improvement.

Circuit No.	Pin No.	Voltage VDC
IK02	1	-11.6
	2	-5.3
	3	-12.1

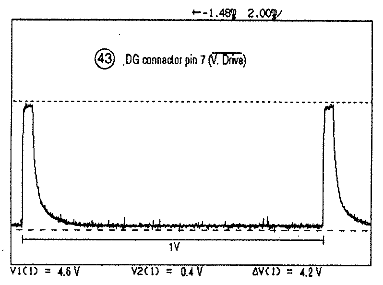
Circuit No.	Pin No.	Voltage VDC
IK04	1	0.1
	2	0.1
	3	0
	4	-33.0
	5	-22.3
	6	0.1
	7	-26.7
	8	33.0
	9	27.0
	10	-26.7
	11	0
	12	-22.4
	13	-33.0
	14	0
	15	0

Circuit No.	Pin No.	Voltage VDC
IK05	1	0.1
	2	0.1
	3	0
	4	-26.8
	5	-18.2
	6	0.1
	7	-26.8
	8	27.0
	9	27.0
	10	-26.8
	11	0
	12	-18.3
	13	-26.8
	14	0
	15	0

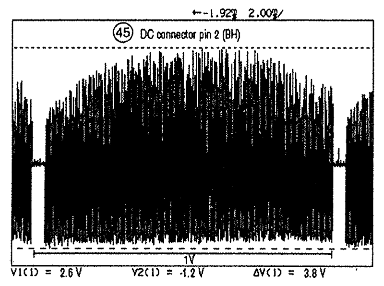
Circuit No.	Pin No.	Voltage VDC
IK06	1	-0.4
	2	-0.4
	3	0
	4	-33.0
	5	-22.6
	6	-0.5
	7	-26.7
	8	33.0
	9	27.0
	10	-26.7
	11	-0.1
	12	-22.4
	13	-33.0
	14	-0.1
	15	-0.1

Circuit No.	Pin No.	Voltage VDC
IK08	1	4.7
	2	5.7
	3	0

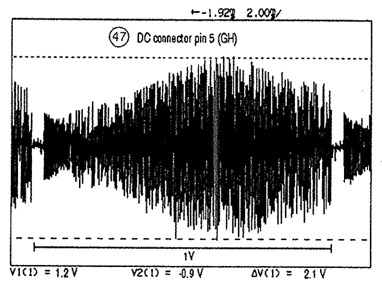
Circuit No.	Pin No.	Voltage VDC
QK01	B	5.3
	C	0.3
	E	0
QK02	B	0
	C	4.9
	E	0
QK03	B	0
	C	4.9
	E	0
QK04	B	0
	C	4.9
	E	0
QK08	B	-0.1
	C	0
	E	0.6
QK09	B	0
	C	-11.0
	E	0.6
QK10	B	-11.6
	C	-5.2
	E	-12.1



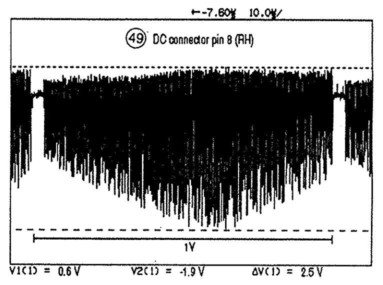
(43) DG connector pin 7 (V. Drive)



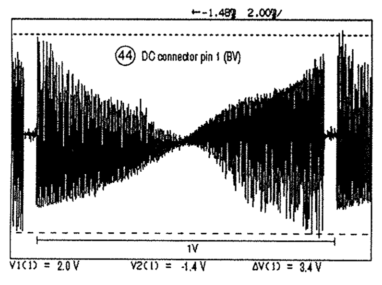
(45) DC connector pin 2 (BH)



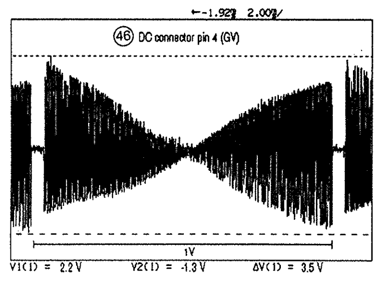
(47) DC connector pin 5 (GH)



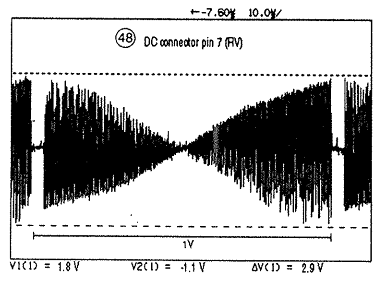
(49) DC connector pin 8 (RH)



(44) DC connector pin 1 (BV)



(46) DC connector pin 4 (GV)



(48) DC connector pin 7 (RV)

BASIC CIRCUIT DIAGRAM

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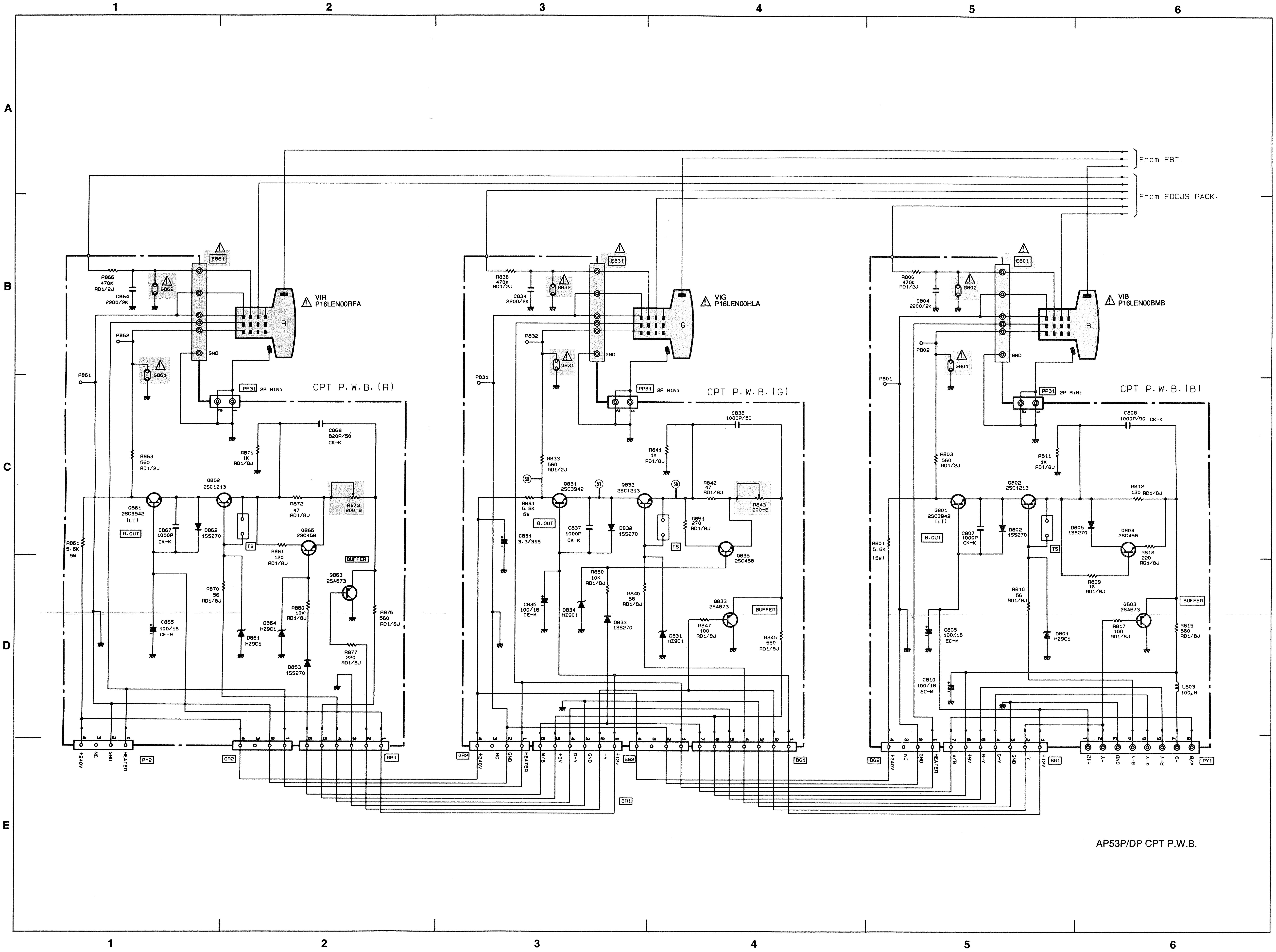
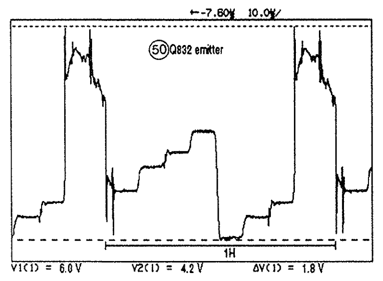

1
2
3
4
5
6
A
B
C
D
E
From FBT.
From FOCUS PACK.
VIR P16LEN00RFA
VIG P16LEN00HLA
VIB P16LEN00BMB
CPT P.W.B. (R)
CPT P.W.B. (G)
CPT P.W.B. (B)
E861
E831
E801
G862
G861
G832
G831
G802
G801
PP31 2P MINI
GND
P861
P862
P831
P832
P801
P802
R866 470K RD1/2J
C864 2200/2K
R836 470K RD1/2J
C834 2200/2K
R806 470K RD1/2J
C804 2200/2K
R863 560 RD1/2J
R833 560 RD1/2J
R803 560 RD1/2J
C868 820P/50 CK-K
C838 1000P/50
C808 1000P/50 CK-K
R871 1K RD1/8J
R841 1K RD1/8J
R811 1K RD1/8J
Q861 2SC3942 (LT)
Q862 2SC1213
Q831 2SC3942
Q832 2SC1213
Q801 2SC3942 (LT)
Q802 2SC1213
R872 47 RD1/8J
R842 47 RD1/8J
R812 130 RD1/8J
R873 200-B
R843 200-B
R-OUT
B-OUT
C867 1000P CK-K
D862 1SS270
TS
Q865 2SC458
R881 120 RD1/8J
BUFFER
R861 5.6K 5W
R831 5.6K 5W
R801 5.6K (5W)
C831 3.3/315
C837 1000P CK-K
D832 1SS270
R851 270 RD1/8J
Q835 2SC458
C807 1000P CK-K
D802 1SS270
D805 1SS270
Q804 2SC458
R818 220 RD1/8J
R809 1K RD1/8J
Q863 2SA673
R870 56 RD1/8J
R880 10K RD1/8J
R875 560 RD1/8J
C865 100/16 CE-M
D861 HZ9C1
D864 HZ9C1
R877 220 RD1/8J
D863 1SS270
R850 10K RD1/8J
C835 100/16 CE-M
D834 HZ9C1
D833 1SS270
R840 56 RD1/8J
Q833 2SA673
R847 100 RD1/8J
D831 HZ9C1
R845 560 RD1/8J
R810 56 RD1/8J
Q803 2SA673
C805 100/16 EC-M
D801 HZ9C1
R817 100 RD1/8J
R815 560 RD1/8J
C810 100/16 EC-M
L803 100μH
+240V
NC
GND
HEATER
W/B
+9V
R-Y
G-Y
B-Y
-Y
+12V
+12
Y
B-Y
G-Y
R-Y
B+
B/W
PY2
GR2
GR1
BG2
BG1
PY1
50
51
52

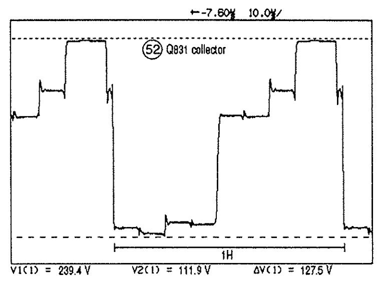
AP53P/DP CPT P.W.B.

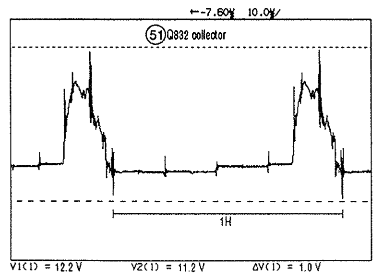
- All DC voltage to be measured with a tester (100kΩ/V). Voltage taken on a complex color bar signal including a standard color bar signal.
- Since this is a basic circuit diagram, the value of the parts is subject to be altered for improvement.

Circuit No.	Pin No.	Voltage VDC
Q801	B	11.8
	C	172.8
	E	11.2
Q802	B	5.3
	C	11.2
	E	4.9
Q803	B	4.1
	C	0
	E	4.2
Q804	B	4.8
	C	4.5
	E	4.6
Q831	B	11.8
	C	175.8
	E	11.3
Q832	B	5.2
	C	11.2
	E	4.8

Circuit No.	Pin No.	Voltage VDC
Q833	B	4.1
	C	0
	E	4.2
Q835	B	1.9
	C	4.8
	E	4.5
Q861	B	11.8
	C	191.2
	E	11.2
Q862	B	5.1
	C	11.2
	E	4.7
Q863	B	4.1
	C	0
	E	4.2
Q865	B	2.3
	C	4.7
	E	4.5

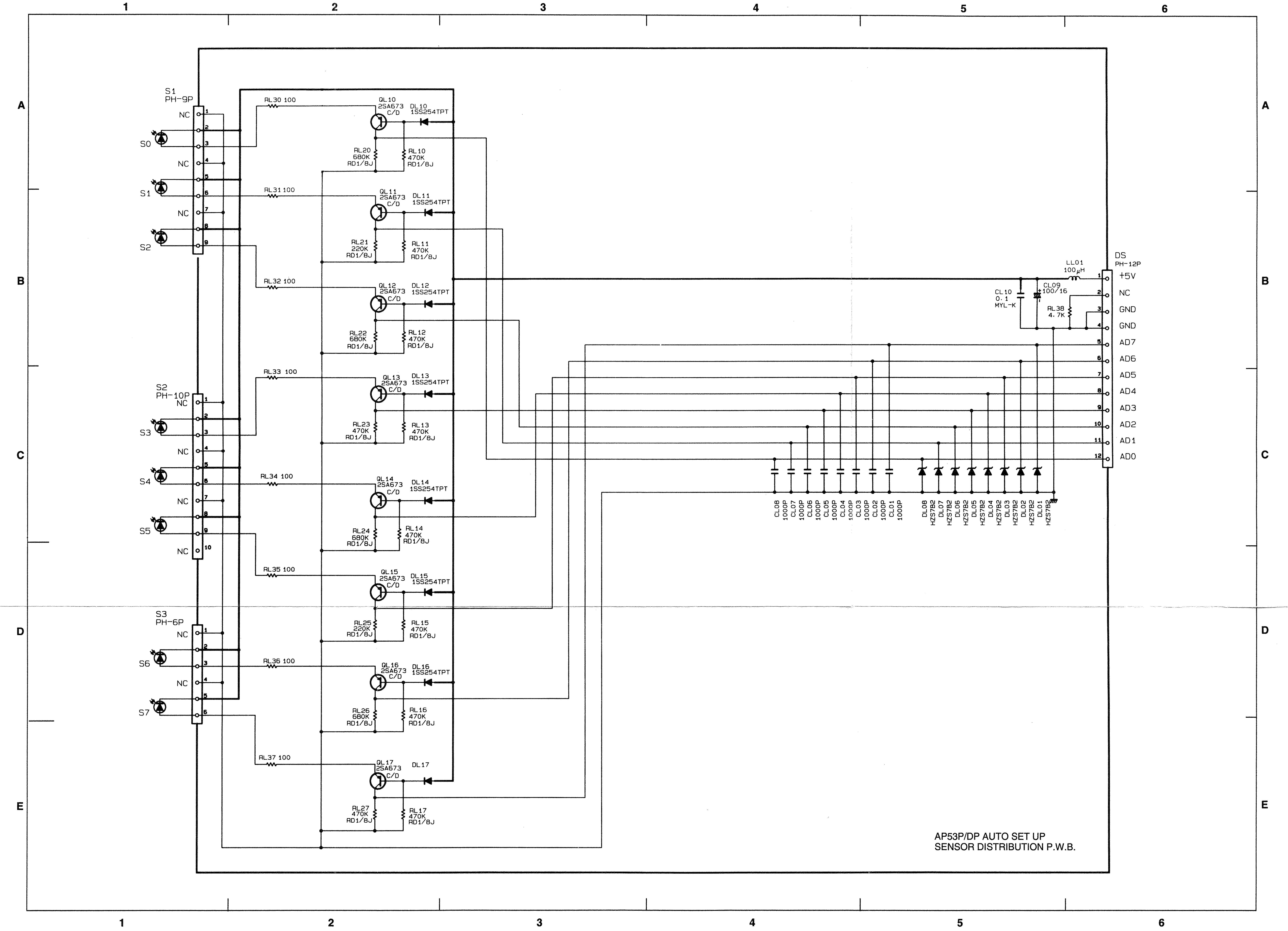






BASIC CIRCUIT DIAGRAM

PRODUCT SAFETY NOTE: Components marked with a ⚠ and shaded have special characteristics important to safety. Before replacing any of these components, read carefully the PRODUCT SAFETY NOTICE of this Service Manual. Don't degrade the safety of the receiver through improper servicing.

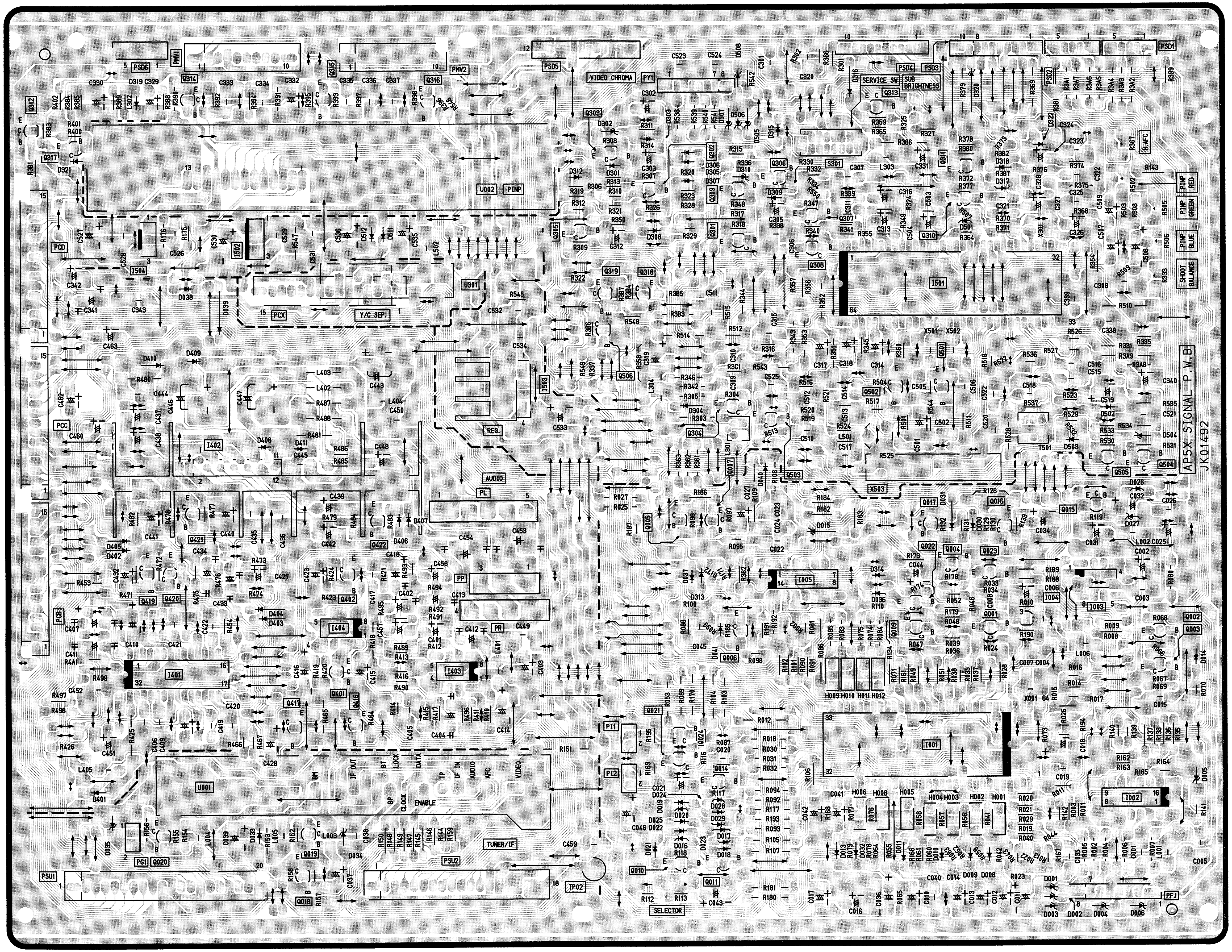

1
2
3
4
5
6
A
B
C
D
E
S1
PH-9P
NC
S0
NC
S1
NC
S2
S2
PH-10P
NC
S3
NC
S4
NC
S5
NC
S3
PH-6P
NC
S6
NC
S7
RL30 100
RL31 100
RL32 100
RL33 100
RL34 100
RL35 100
RL36 100
RL37 100
QL10 2SA673 C/D
DL10 1SS254TPT
RL20 680K RD1/8J
RL10 470K RD1/8J
QL11 2SA673 C/D
DL11 1SS254TPT
RL21 220K RD1/8J
RL11 470K RD1/8J
QL12 2SA673 C/D
DL12 1SS254TPT
RL22 680K RD1/8J
RL12 470K RD1/8J
QL13 2SA673 C/D
DL13 1SS254TPT
RL23 470K RD1/8J
RL13 470K RD1/8J
QL14 2SA673 C/D
DL14 1SS254TPT
RL24 680K RD1/8J
RL14 470K RD1/8J
QL15 2SA673 C/D
DL15 1SS254TPT
RL25 220K RD1/8J
RL15 470K RD1/8J
QL16 2SA673 C/D
DL16 1SS254TPT
RL26 680K RD1/8J
RL16 470K RD1/8J
QL17 2SA673 C/D
DL17
RL27 470K RD1/8J
RL17 470K RD1/8J
LL01 100μH
CL10 0.1 MYL-K
CL09 100/16
RL38 4.7K
DS
PH-12P
+5V
NC
GND
GND
AD7
AD6
AD5
AD4
AD3
AD2
AD1
AD0
CL08 1000P
CL07 1000P
CL06 1000P
CL05 1000P
CL04 1000P
CL03 1000P
CL02 1000P
CL01 1000P
DL08 HZS7B2
DL07 HZS7B2
DL06 HZS7B2
DL05 HZS7B2
DL04 HZS7B2
DL03 HZS7B2
DL02 HZS7B2
DL01 HZS7B2
AP53P/DP AUTO SET UP
SENSOR DISTRIBUTION P.W.B.

- All DC voltage to be measured with a tester (100kΩ/V). Voltage taken on a complex color bar signal including a standard color bar signal.
- Since this is a basic circuit diagram, the value of the parts is subject to be altered for improvement.

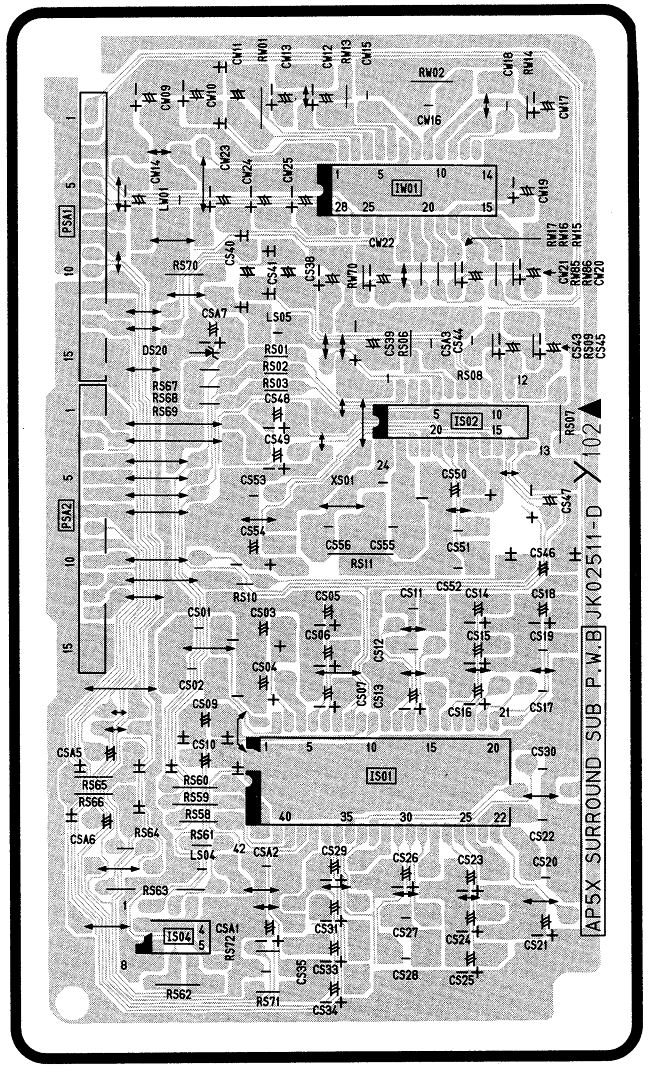
Circuit No.	Pin No.	Voltage VDC
QL10	B	4.3
	C	0.1
	E	4.6
QL11	B	4.3
	C	0.6
	E	4.7
QL12	B	4.3
	C	0.9
	E	4.7
QL13	B	4.3
	C	1.0
	E	4.7
QL14	B	4.3
	C	0.7
	E	4.7
QL15	B	4.4
	C	3.6
	E	4.8
QL16	B	4.3
	C	0.3
	E	4.6
QL17	B	4.3
	C	0.5
	E	4.7

PRINTED CIRCUIT BOARD

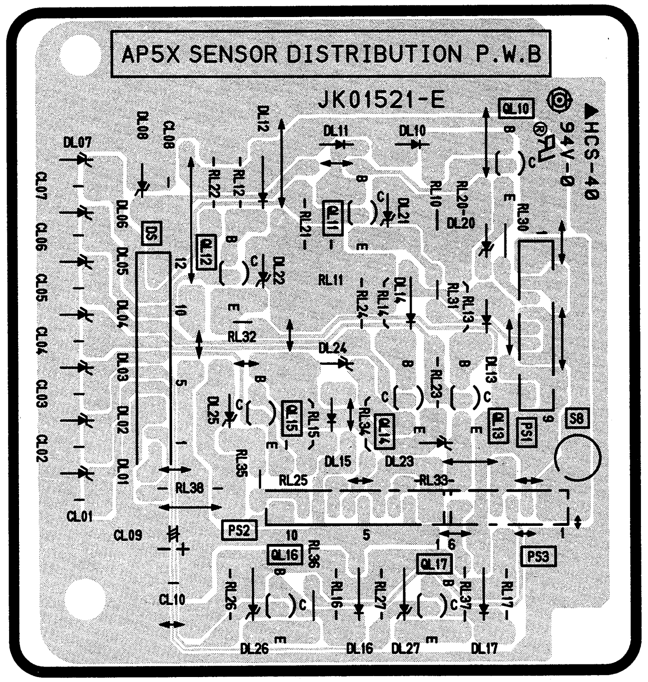
SIGNAL P.C.B.


AP5X SIGNAL P.W.B
JK01492
VIDEO CHROMA
SERVICE SW
SUB BRIGHTNESS
PINP RED
PINP GREEN
PINP BLUE
SHOOT BALANCE
H.AFC
Y/C SEP.
AUDIO
REG.
TUNER/IF
SELECTOR
I501
I001
I005
U001
U301
I401
I402
I403
I404

SURROUND SUB P.W.B.

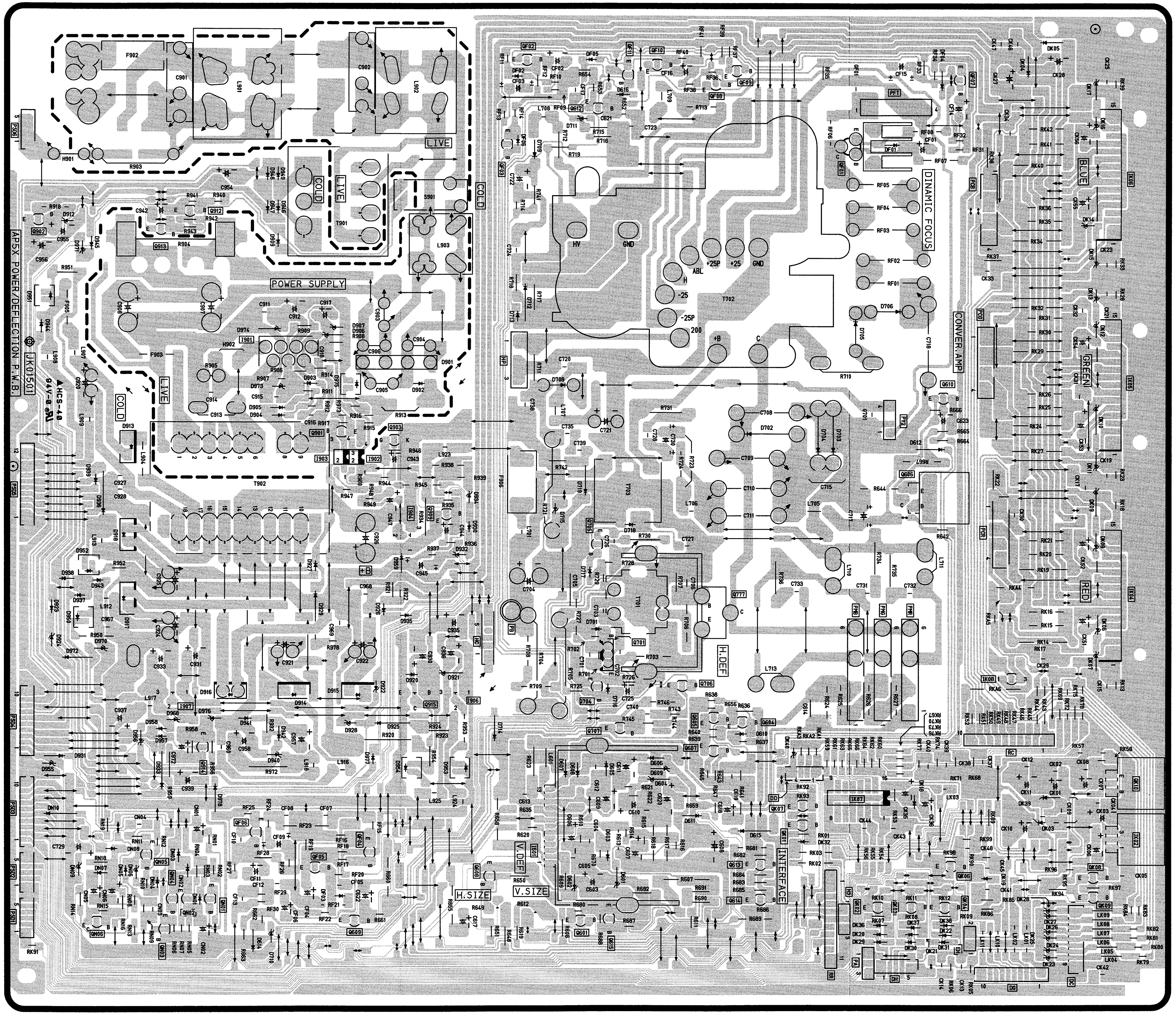

AP5X SURROUND SUB P.W.B JK02511-D
X102
IW01
I501
I502
I504

SENSOR DISTRIBUTION P.C.B.

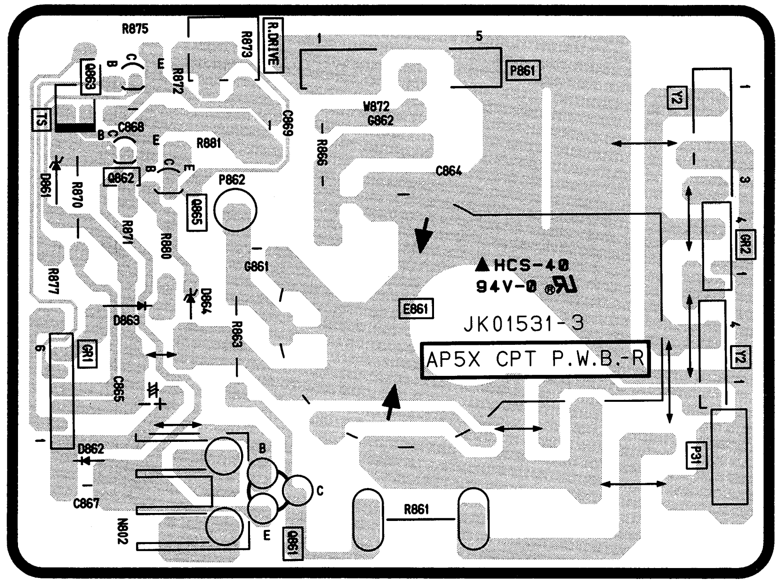

AP5X SENSOR DISTRIBUTION P.W.B
JK01521-E
HCS-40
94V-0

PRINTED CIRCUIT BOARD

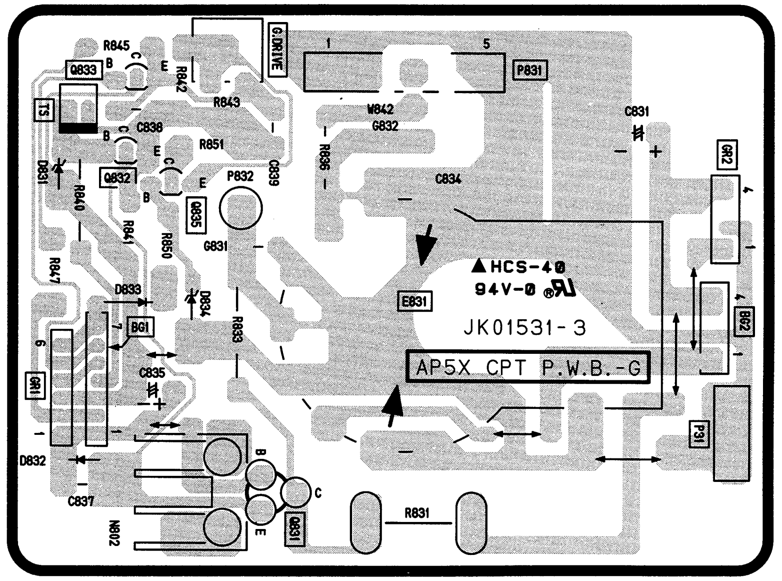
POWER/DEFLECTION P.C.B.


AP5X POWER/DEFLECTION P.W.B.
JK01501
▲HCS-40
94V-0
POWER SUPPLY
LIVE
COLD
DINAMIC FOCUS
CONVER.AMP
INTERFACE
H.DEF
V.DEF
H.SIZE
V.SIZE
BLUE
GREEN
RED
HV
GND
ABL
+25P
+25
-25
-25P
200
+B

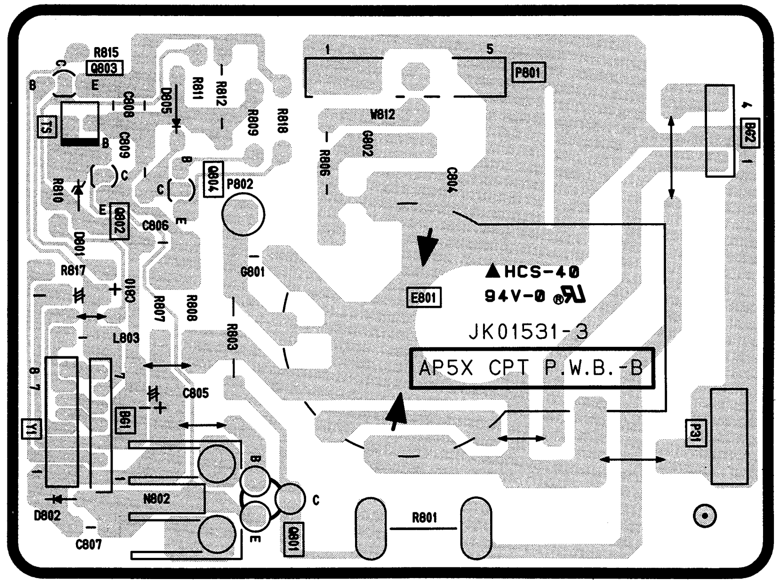
RED CPT P.C.B.


R.DRIVE
▲HCS-40
94V-0
JK01531-3
AP5X CPT P.W.B.-R

GREEN CPT P.C.B.

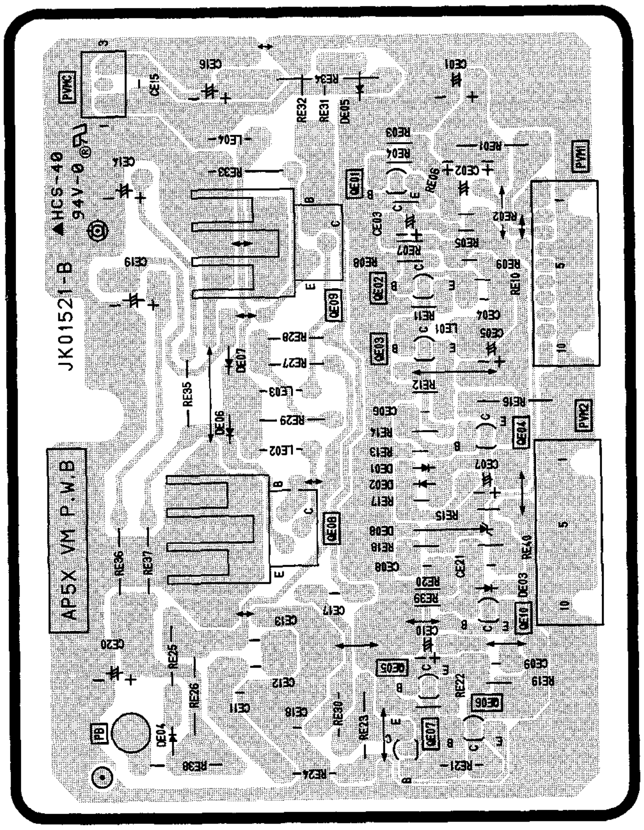

G.DRIVE
▲HCS-40
94V-0
JK01531-3
AP5X CPT P.W.B.-G

BLUE CPT P.C.B.

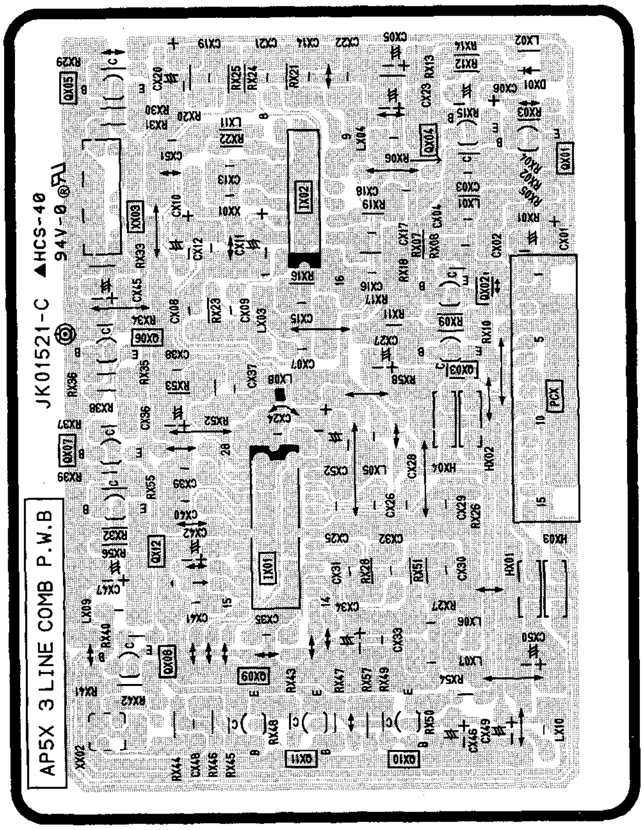

▲HCS-40
94V-0
JK01531-3
AP5X CPT P.W.B.-B

PRINTED CIRCUIT BOARD

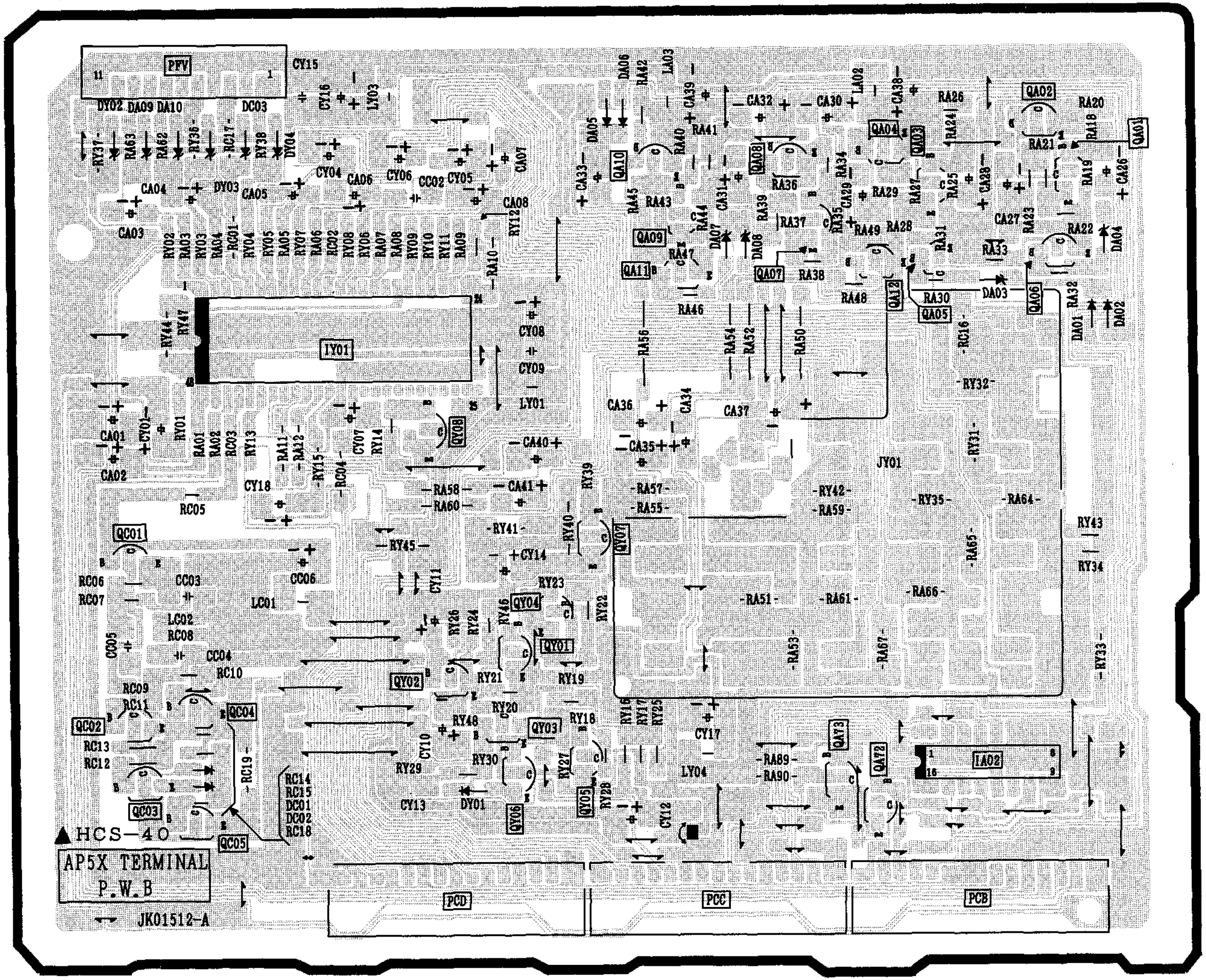
VM P.C.B.


JK01521-B
▲HCS-40
94V-0
AP5X VM P.W.B
PVM0
PVM1
PVM2
PB

3 LINE COMB P.C.B.

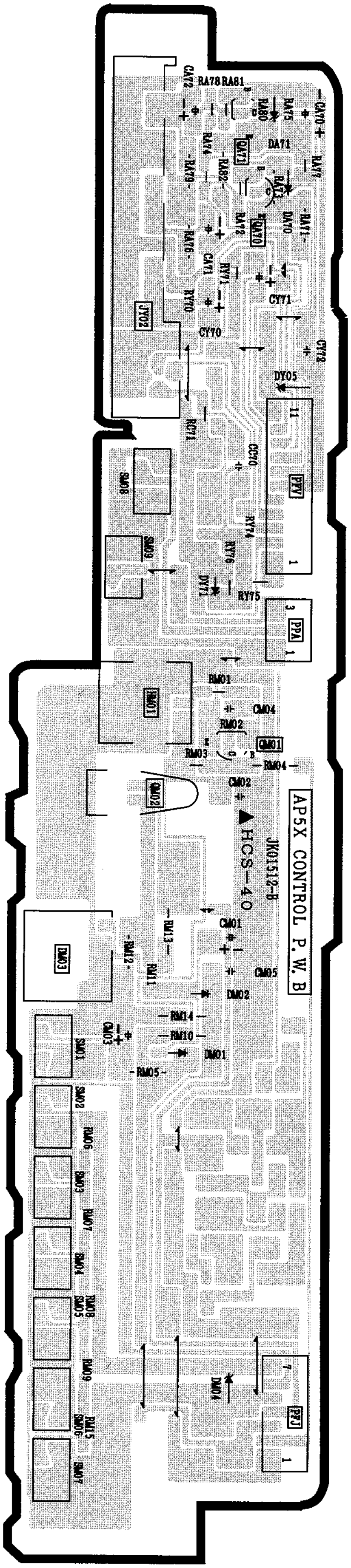

JK01521-C
▲HCS-40
94V-0
AP5X 3 LINE COMB P.W.B
IX01
IX02
PCX

TERMINAL P.C.B.

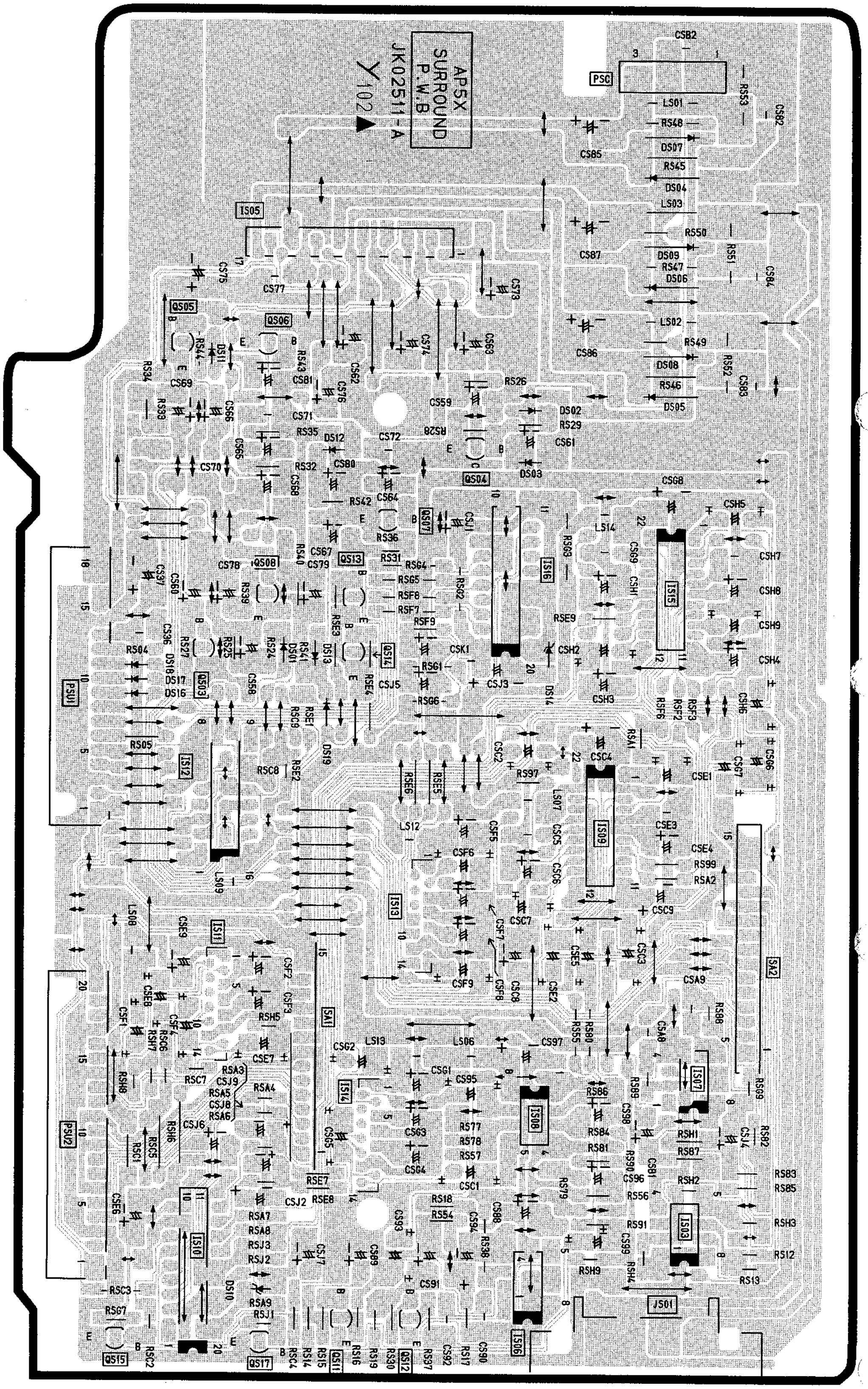

PFV
IY01
JY01
IA02
▲HCS-40
AP5X TERMINAL P.W.B
JK01512-A
PCD
PCC
PCB

PRINTED CIRCUIT BOARD

CONTROL P.C.B.


AP5X CONTROL P.W.B
JK01512-B
HCS-40
JY02
PFY
PPA
PFJ
SM01
SM02
SM03
SM04
SM05
SM06
SM07
SM08
SM09
QM01
QM02
DM03

SURROUND P.C.B.


AP5X SURROUND P.W.B
JK02511-A
Y102
IS05
IS06
IS08
IS09
IS10
IS11
IS12
IS13
IS14
IS15
IS16
IS97
IS03
PSU1
PSU2
PSC
SA1
SA2
JS01
QS05
QS06
QS04
QS07
QS08
QS13
QS14
QS03
QS15
QS17
QS11
QS12

WIRING DIAGRAM

SA2

1	HALL/MATRIX L
2	HALL/MATRIX R
3	GND
4	CLOCK
5	DATA
6	LOAD 2
7	GND
8	C OUT
9	GND
10	S OUT
11	GND
12	Vret
13	+9V
14	GND
15	GND

SU2

1	HiFi L
2	HiFi R
3	GND
4	L
5	R
6	V NOTE
7	SDA 2
8	SCL 2
9	CLOCK
10	DATA
11	LOAD 2
12	MUTE 2
13	+9V
14	GND
15	26V
16	26V
17	GND
18	GND

SA1

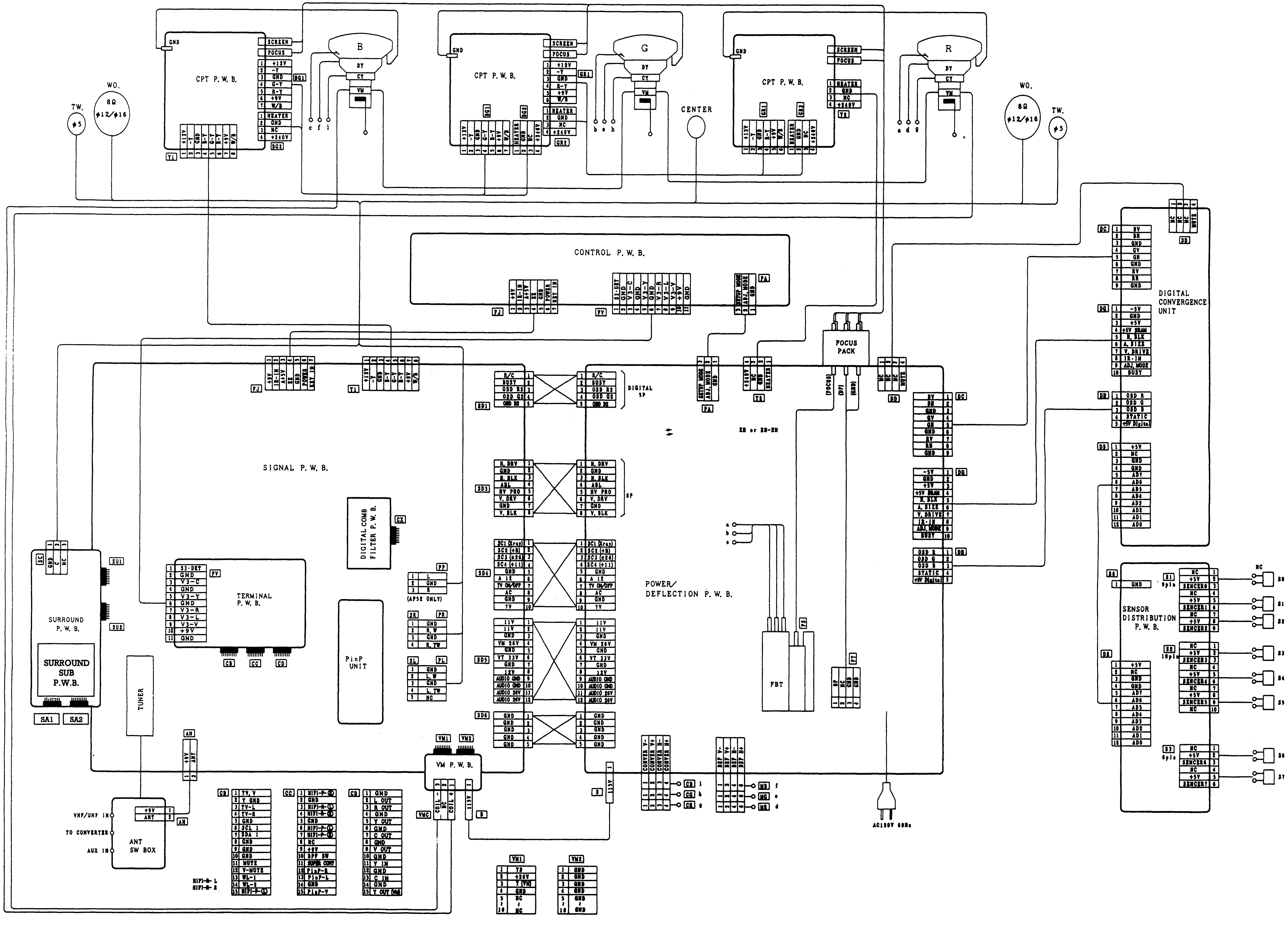
1	SCL 1
2	SDA 1
3	GND
4	TV R
5	TV L
6	GND
7	TV AUDIO
8	GND
9	OFF/PROLOGIC L
10	OFF/PROLOGIC R
11	GND
12	L
13	R
14	GND
15	GND

SU1

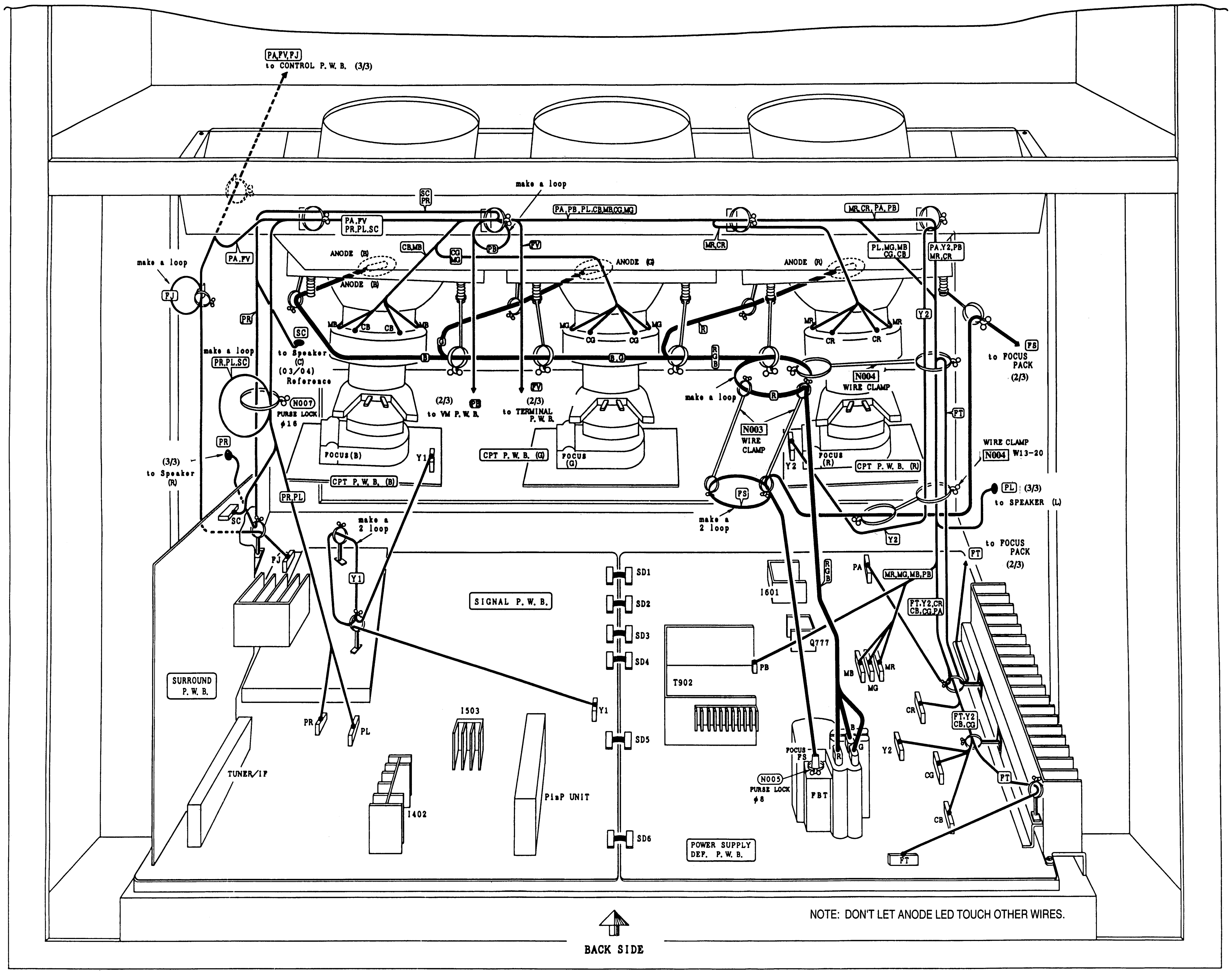
1	HiFi REAR (L)
2	HiFi REAR (R)
3	GND
4	SCL 1
5	SDA 1
6	GND
7	TV R
8	TV L
9	GND
10	TV AUDIO
11	GND
12	PINP Lin
13	PINP Rin
14	GND
15	PINP Lout
16	PINP Rout
17	GND
18	L
19	R
20	F-SP OFF

CX

1	VIDEO IN
2	GND
3	NC
4	GND
5	C, OUT
6	+9V
7	Y, OUT
8	NC
9	GND
10	+5V
11	NC
12	NC
13	NC
14	NC
15	NC

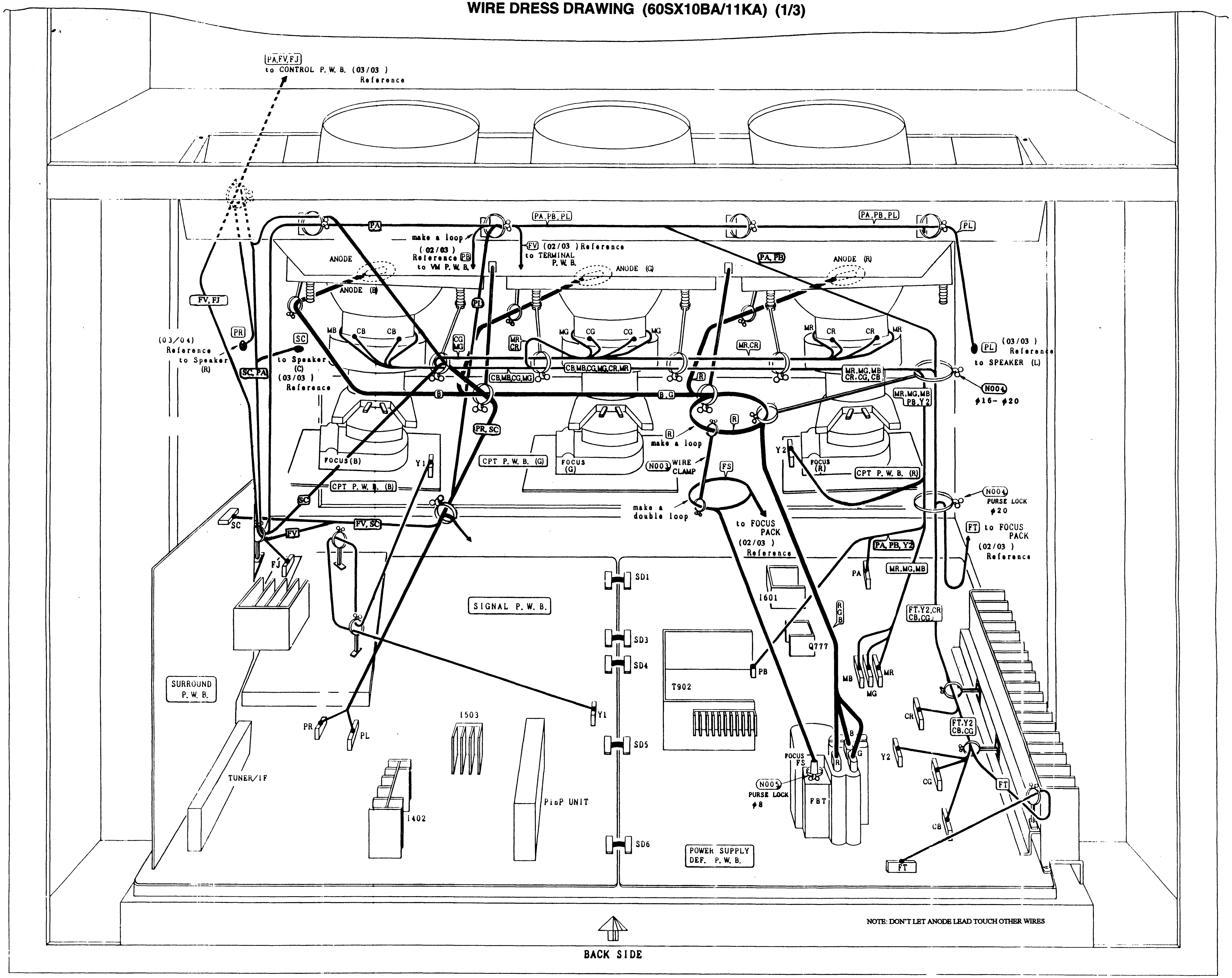

CPT P. W. B.
B
G
R
DY
CY
VM
GND
SCREEN
FOCUS
HEATER
+240V
W/B
BG1
BG2
GR1
GR2
YB
Y1
TW.
φ5
WO.
8Ω
φ12/φ16
CENTER
CONTROL P. W. B.
PJ
PY
PA
SIGNAL P. W. B.
DIGITAL COMB FILTER P. W. B.
CX
PP
(AP52 ONLY)
SR
PR
SL
PL
SURROUND P. W. B.
SURROUND SUB P.W.B.
SU1
SU2
SA1
SA2
TERMINAL P. W. B.
CB
CC
CD
PinP UNIT
TUNER
AN
ANT SW BOX
VHF/UHF IN
TO CONVERTER
AUX IN
+9V
ANT
HIFI-R-L
HIFI-R-R
VM P. W. B.
VM1
VM2
VMC
DIGITAL SP
SD1
SD3
SD4
SD5
SD6
EH or EH-EH
FOCUS PACK
POWER/ DEFLECTION P. W. B.
FBT
AC120V 60Hz
DIGITAL CONVERGENCE UNIT
DC
DG
DH
DS
DD
SENSOR DISTRIBUTION P. W. B.
S0
S1 9pin
S2 10pin
S3 6pin
SENCER0
SENCER1
SENCER2
SENCER3
SENCER4
SENCER5
SENCER6
SENCER7
NC
S0
S1
S2
S3
S4
S5
S6
S7

WIRE DRESS DRAWING (46UX20BA/21KA, 50UX22BA/23KA, 50SX7PA) (1/3)


PA,FV,PJ
to CONTROL P.W.B. (3/3)
make a loop
SC PR
PA,FV PR,PL,SC
PA,PB,PL,CB,MB,CG,MG
MR,CR,PA,PB
PA,FV
make a loop
PJ
CB,MB
CG MG
PB
FV
MR,CR
PL,MG,MB CG,CB
PA,Y2,PB MR,CR
ANODE (B)
ANODE (B)
ANODE (G)
ANODE (R)
MB
CB
CB
MB
MG
CG
CG
MG
MR
CR
CR
MR
PR
SC
to Speaker (C) (03/04) Reference
B
G
B,G
R
R G B
Y2
FS
to FOCUS PACK (2/3)
make a loop
PR,PL,SC
N007
PURSE LOCK ϕ16
(2/3) to VM P.W.B.
PB
FV
(2/3) to TERMINAL P.W.B.
make a loop
R
N004
WIRE CLAMP
N003
WIRE CLAMP
PT
WIRE CLAMP
N004 W13-20
PR
(3/3) to Speaker (R)
FOCUS(B)
Y1
CPT P.W.B. (G)
FOCUS (G)
Y2
FOCUS (R)
CPT P.W.B. (R)
CPT P.W.B. (B)
PL (3/3) to SPEAKER (L)
PR,PL
FS
make a 2 loop
Y2
SC
PJ
make a 2 loop
Y1
to FOCUS PACK (2/3)
PT
SD1
SD2
SD3
SD4
SD5
SD6
SIGNAL P.W.B.
R G B
I601
PA
MR,MG,MB,PB
FT,Y2,CR CB,CG,PA
Q777
PB
T902
MB
MG
MR
CR
FT,Y2 CB,CG
Y2
CG
CB
FT
PT
SURROUND P.W.B.
I503
Y1
PR
PL
B
R
G
FOCUS FS
N005
PURSE LOCK ϕ8
FBT
TUNER/IF
I402
PinP UNIT
POWER SUPPLY DEF. P.W.B.
BACK SIDE

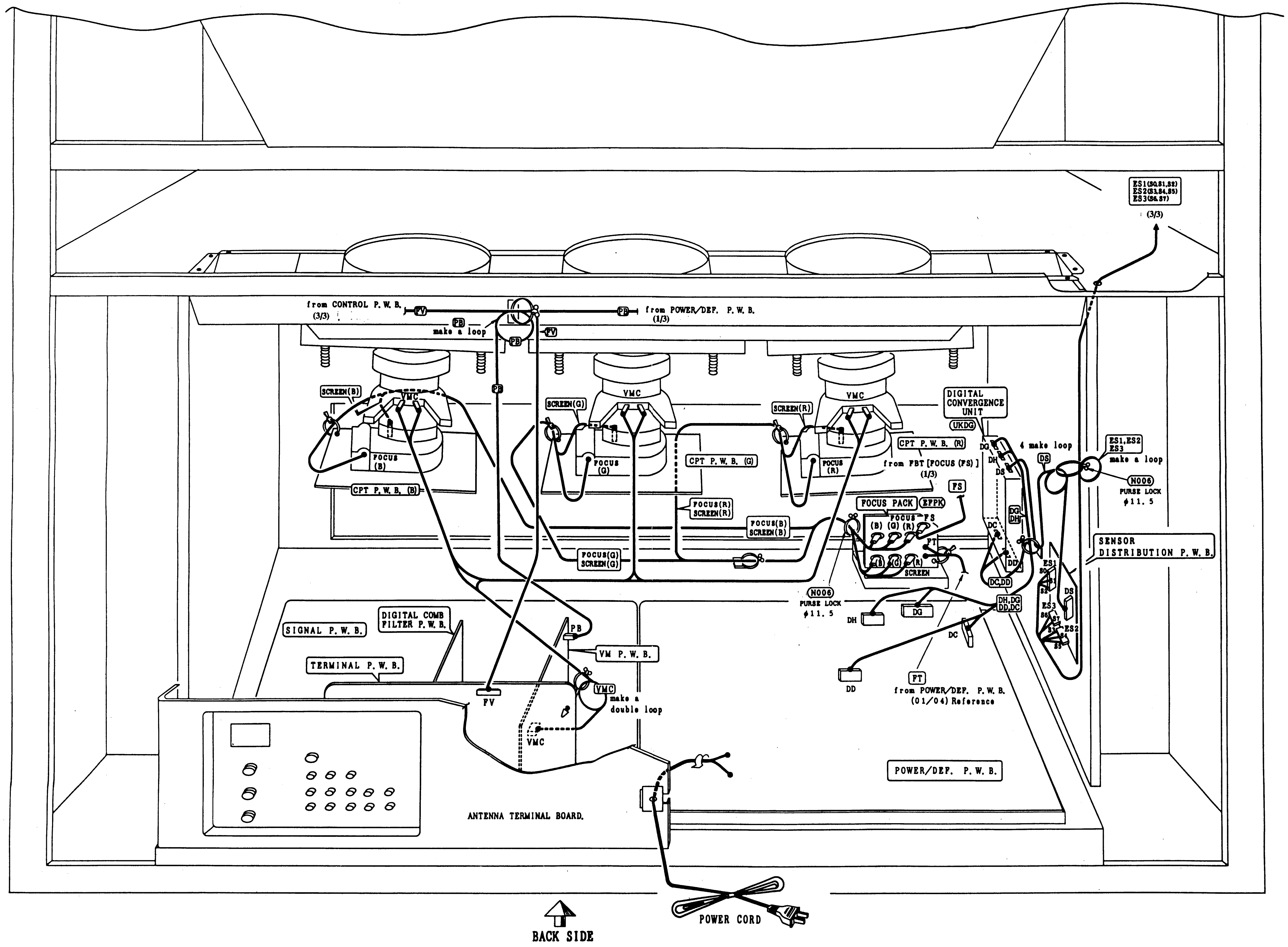
NOTE: DON'T LET ANODE LED TOUCH OTHER WIRES.

WIRE DRESS DRAWING (60SX10BA/11KA) (1/3)

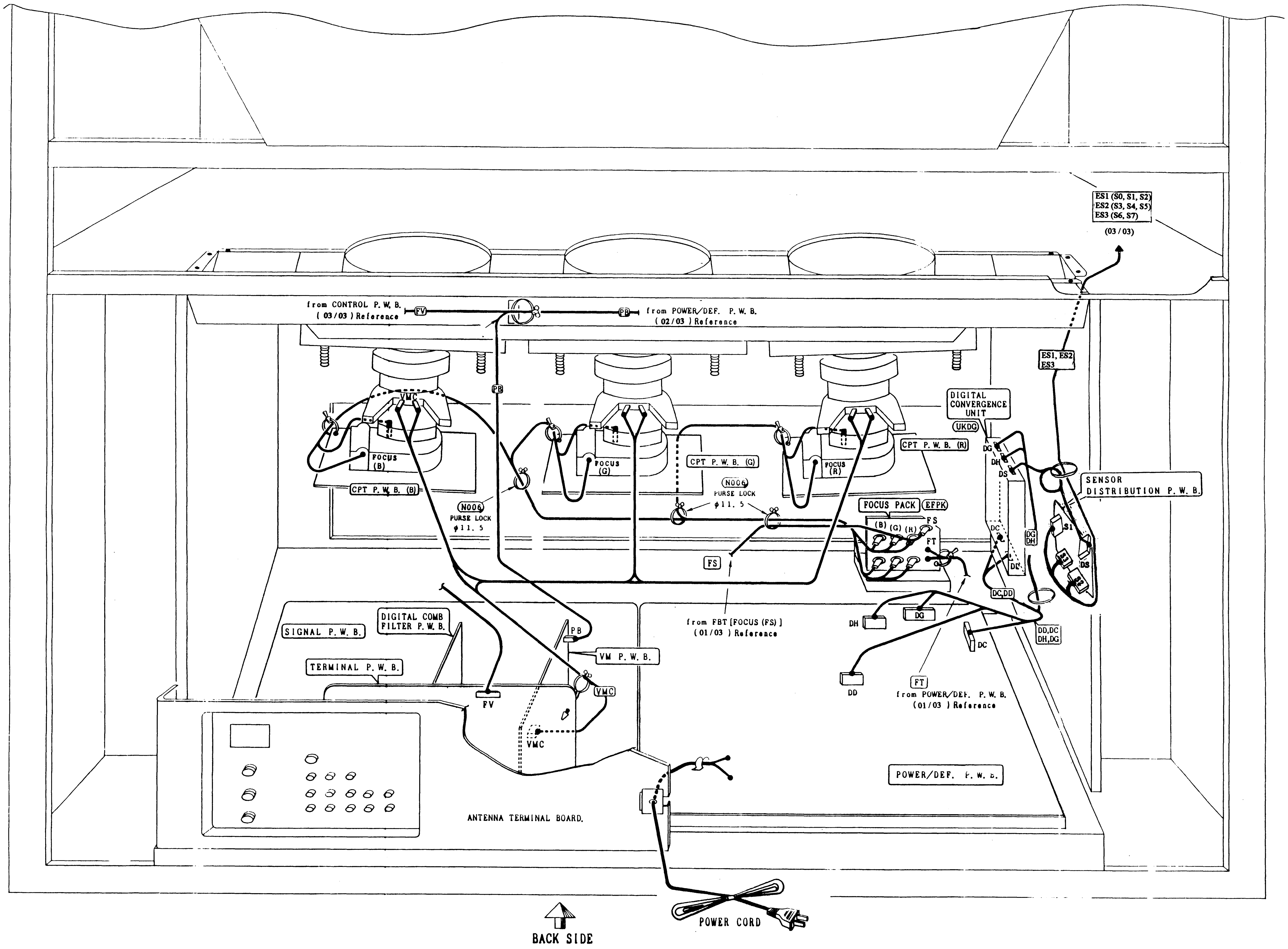

PA,FV,FJ
to CONTROL P. W. B. (03/03)
Reference
PA
make a loop
(02/03)
Reference PB
to VM P. W. B.
PA,PB,PL
FV (02/03) Reference
to TERMINAL
P. W. B.
PA,PB,PL
PL
PA, PB
ANODE
ANODE (B)
ANODE (G)
ANODE (R)
FV, FJ
PR
(03/04)
Reference
to Speaker
(R)
SC
to Speaker
(C)
(03/03)
Reference
SC, PA
PL
MB
CB
CB
CG
MG
MR
CR
MG
CG
CG
MG
MR,CR
MR
CR
CR
MR
CB,MB,CG,MG
CB,MB,CG,MG,CR,MR
MR,MG,MB
CR,CG,CB
PL (03/03)
Reference
to SPEAKER (L)
N004
ϕ16- ϕ20
MR,MG,MB
PB,Y2
B
B,G
R
R
R
PR, SC
R
make a loop
N003 WIRE
CLAMP
FS
FOCUS (B)
Y1
CPT P. W. B. (G)
FOCUS
(G)
Y2
FOCUS
(R)
CPT P. W. B. (R)
CPT P. W. B. (B)
SC
make a
double loop
to FOCUS
PACK
(02/03)
Reference
N004
PURSE LOCK
ϕ20
FT to FOCUS
PACK
(02/03)
Reference
SC
FV
FV, SC
FJ
PA, PB, Y2
PA
MR,MG,MB
SD1
SIGNAL P. W. B.
1601
R
G
B
FT,Y2,CR
CB,CG
SD3
Q777
SD4
PB
MB
MR
MG
T902
SURROUND
P. W. B.
Y1
1503
PR
PL
CR
SD5
FOCUS
FS
B
R
G
Y2
FT,Y2
CB,CG
FT
CG
N005
PURSE LOCK
ϕ8
FBT
TUNER/IF
PinP UNIT
1402
CB
SD6
POWER SUPPLY
DEF. P. W. B.
FT
BACK SIDE

NOTE: DON'T LET ANODE LEAD TOUCH OTHER WIRES

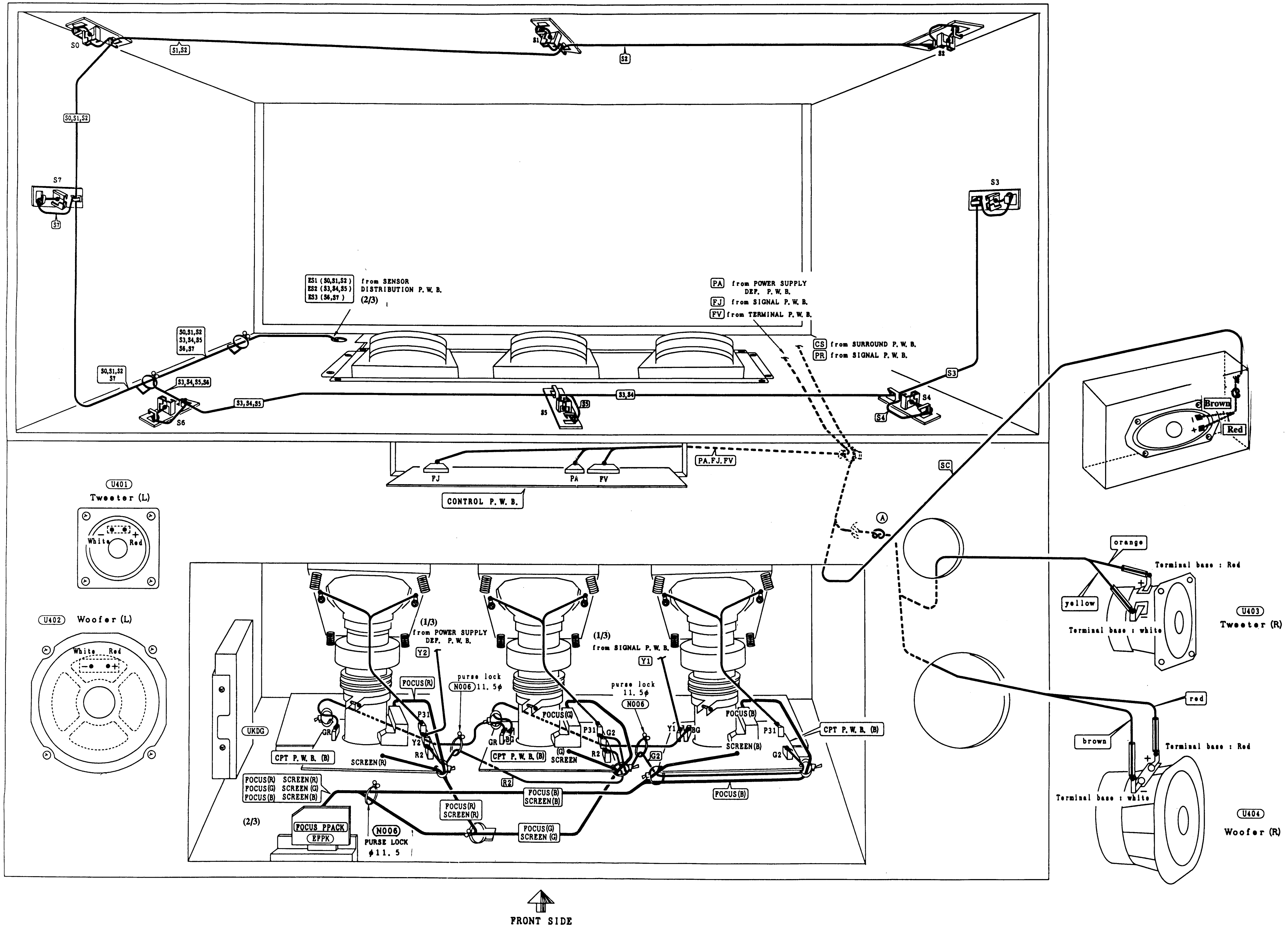
WIRE DRESS DRAWING (46UX20BA/21KA, 50UX22BA/23KA, 50SX7PA) (2/3)


from CONTROL P. W. B. (3/3)
FV
PB
make a loop
PB
FV
PB
from POWER/DEF. P. W. B. (1/3)
ES1(S0,S1,S2)
ES2(S3,S4,S5)
ES3(S6,S7)
(3/3)
SCREEN(B)
VMC
FOCUS (B)
CPT P. W. B. (B)
SCREEN(G)
VMC
FOCUS (G)
CPT P. W. B. (G)
SCREEN(R)
VMC
FOCUS (R)
FOCUS(R) SCREEN(R)
FOCUS(B) SCREEN(B)
FOCUS(G) SCREEN(G)
DIGITAL CONVERGENCE UNIT
UKDG
CPT P. W. B. (R)
from FBT [FOCUS (FS)] (1/3)
FS
FOCUS PACK
EFPK
FOCUS FS
(B) (G) (R)
FT
(B) (G) (R)
SCREEN
DG
DH
DS
4 make loop
DS
ES1,ES2 ES3
make a loop
N006
PURSE LOCK
ϕ11. 5
DG DH
DC
DD
DC,DD
DH,DG DD,DC
SENSOR DISTRIBUTION P. W. B.
ES1
S0
S1
S2
DS
ES3
S6
S7
S3
ES2
S4
N006
PURSE LOCK
ϕ11. 5
DH
DG
DC
DD
FT
from POWER/DEF. P. W. B. (01/04) Reference
SIGNAL P. W. B.
DIGITAL COMB FILTER P. W. B.
TERMINAL P. W. B.
PB
VM P. W. B.
FV
VMC
make a double loop
VMC
POWER/DEF. P. W. B.
ANTENNA TERMINAL BOARD.
POWER CORD
BACK SIDE

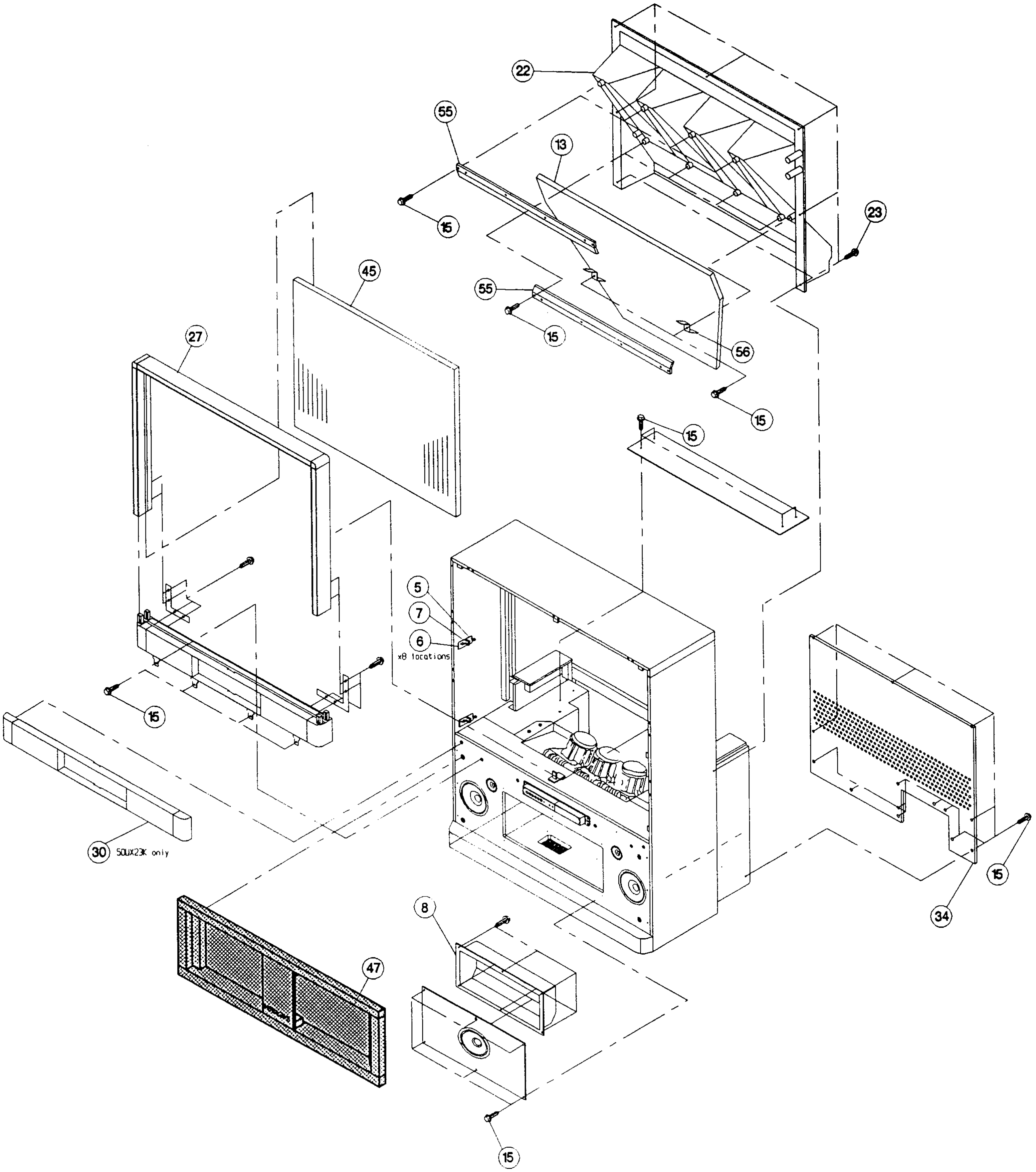
WIRE DRESS DRAWING (60SX10BA/11KA) (2/3)


ES1 (S0, S1, S2)
ES2 (S3, S4, S5)
ES3 (S6, S7)
(03/03)
from CONTROL P. W. B.
(03/03) Reference
FV
PB
from POWER/DEF. P. W. B.
(02/03) Reference
ES1, ES2
ES3
PB
VMC
DIGITAL
CONVERGENCE
UNIT
(UKDG)
CPT P. W. B. (R)
DG
DH
DS
SENSOR
DISTRIBUTION P. W. B.
FOCUS (B)
FOCUS (G)
CPT P. W. B. (G)
FOCUS (R)
CPT P. W. B. (B)
(N006)
PURSE LOCK
φ11. 5
(N006)
PURSE LOCK
φ11. 5
FOCUS PACK
(EFPK)
(B) (G) (R)
FS
FT
S1
S2
S3
DS
DC
DG
DH
DD
DC,DD
FS
from FBT [FOCUS (FS)]
(01/03) Reference
DH
DG
DD,DC
DH,DG
DC
DD
FT
from POWER/DEF. P. W. B.
(01/03) Reference
SIGNAL P. W. B.
DIGITAL COMB
FILTER P. W. B.
PB
VM P. W. B.
TERMINAL P. W. B.
VMC
FV
VMC
ANTENNA TERMINAL BOARD.
POWER/DEF. P. W. B.
POWER CORD
BACK SIDE

WIRE DRESS DRAWING (46UX20BA/21KA, 50UX22BA/23KA, 50SX7PA) (3/3)

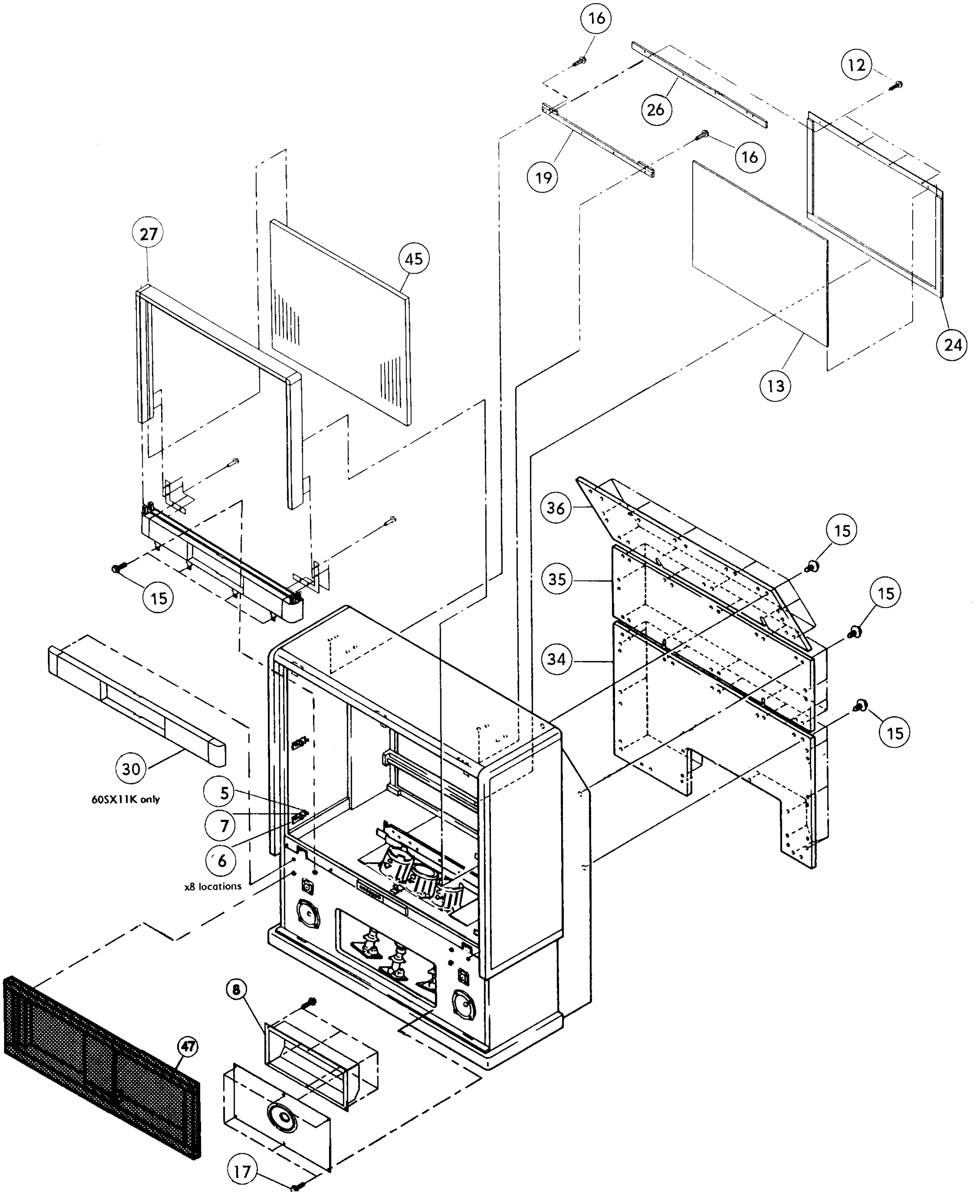

S0
S1,S2
S1
S2
S2
S0,S1,S2
S7
S7
S3
ES1 (S0,S1,S2)
ES2 (S3,S4,S5)
ES3 (S6,S7)
from SENSOR DISTRIBUTION P. W. B.
(2/3)
PA from POWER SUPPLY DEF. P. W. B.
FJ from SIGNAL P. W. B.
FV from TERMINAL P. W. B.
CS from SURROUND P. W. B.
PR from SIGNAL P. W. B.
S0,S1,S2 S3,S4,S5 S6,S7
S0,S1,S2 S7
S3,S4,S5,S6
S3,S4,S5
S6
S5
S5
S3,S4
S3
S4
S4
Brown
Red
PA.FJ.FV
FJ
PA
FV
CONTROL P. W. B.
SC
Ⓐ
U401
Tweeter (L)
White
Red
U402
Woofer (L)
White
Red
orange
Terminal base : Red
yellow
Terminal base : white
U403
Tweeter (R)
red
brown
Terminal base : Red
Terminal base : white
U404
Woofer (R)
(1/3)
from POWER SUPPLY DEF. P. W. B.
Y2
(1/3)
from SIGNAL P. W. B.
Y1
purse lock
N006 11. 5ϕ
purse lock
11. 5ϕ
N006
FOCUS(R)
FOCUS(G)
FOCUS(B)
UKDG
GR
P31
Y2
R2
CPT P. W. B. (B)
SCREEN(R)
GR
BG
CPT P. W. B. (B)
(G) SCREEN
P31
G2
R2
Y1
BG
P31
SCREEN(B)
G2
G2
CPT P. W. B. (B)
FOCUS(R) SCREEN(R)
FOCUS(G) SCREEN(G)
FOCUS(B) SCREEN(B)
R2
FOCUS(B) SCREEN(B)
FOCUS(B)
FOCUS(R) SCREEN(R)
(2/3)
FOCUS PPACK
EPPK
N006
PURSE LOCK
ϕ11. 5
FOCUS(G) SCREEN(G)
FRONT SIDE

EXPLODED VIEW (46UX20BA/21KA, 50UX22BA/23KA, 50SX7PA) (1/3)


22
55
13
15
23
45
55
15
27
56
15
15
5
7
6
x8 locations
15
30
50UX23K only
15
34
8
47
15

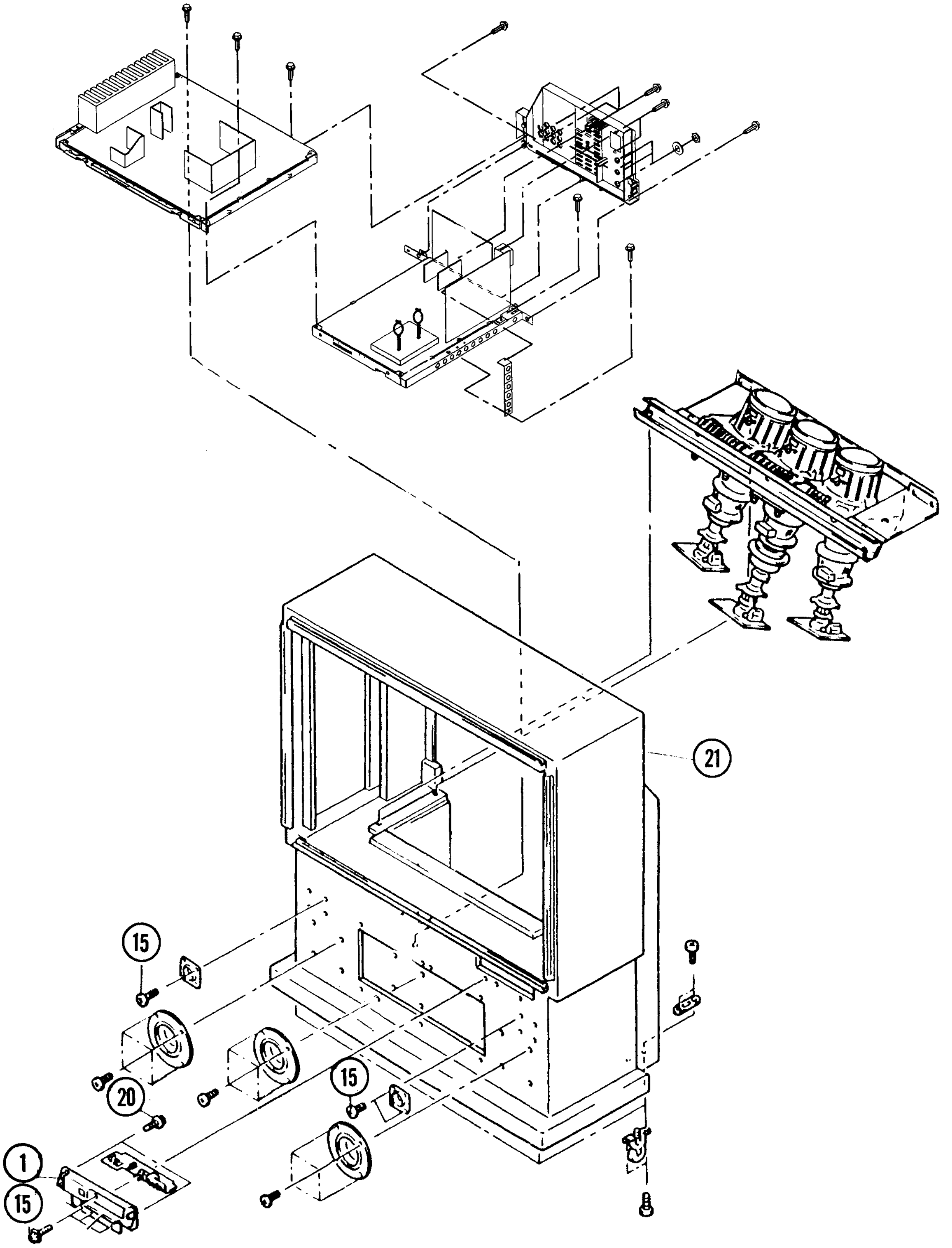
Note: Some parts may appear different than those shown in the exploded view. When ordering, refer to the REPLACEMENT PARTS LIST for correct part number. Since this Service Manual covers several models, use care to select the correct part for the model being serviced.

EXPLODED VIEW (60SX10BA/11KA) (1/3)


16
26
12
16
19
27
45
24
13
36
15
35
15
34
15
15
30
60SX11K only
5
7
6
x8 locations
8
47
17

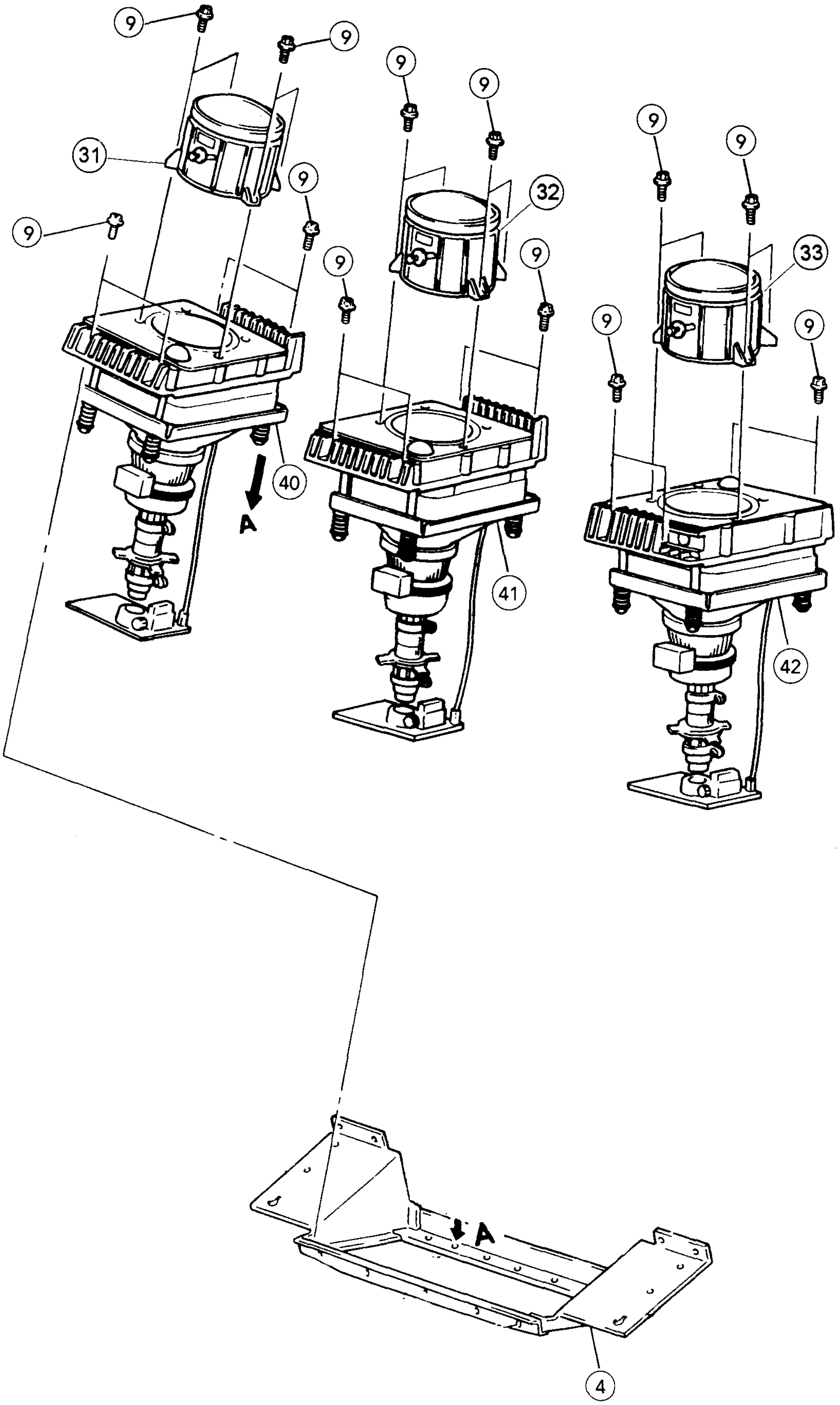
Note: Some parts may appear different than those shown in the exploded view. When ordering, refer to the REPLACEMENT PARTS LIST for correct part number. Since this Service Manual covers several models, use care to select the correct part for the model being

EXPLODED VIEW (2/3)



Note: Some parts may appear different than those shown in the exploded view. When ordering, refer to the REPLACEMENT PARTS LIST for correct part number. Since this Service Manual covers several models, use care to select the correct part for the model being serviced.

EXPLODED VIEW (3/3)



Note: Some parts may appear different than those shown in the exploded view. When ordering, refer to the REPLACEMENT PARTS LIST for correct part number. Since this Service Manual covers several models, use care to select the correct part for the model being serviced.

REPLACEMENT PARTS LIST

PRODUCT SAFETY NOTE: Components marked with a ⚠ have special characteristics important to safety. Before replacing any of these components, read carefully, the PRODUCT SAFETY NOTICE of this Service Manual. Don't degrade the safety of the receiver through improper servicing.

ABBREVIATIONS

Capacitors:
CD: Ceramic Disc
PF: Polyester Film
EL: Electrolytic
PP: Polypropylene
PR: Paper
TA: Tantalum
TM: Trimmer

Resistors:
CF: Carbon Film
CC: Carbon Composition
MF: Metal Oxide Film
VR: Variable Resistor
WW: Wire Wound
FR: Fuse Resistor
MG: Metal Glaze

Semiconductors:
TR: Transistor
DI: Diode
ZD: Zener Diode
VA: Varistor
TH: Thermistor
IC: Integrated Circuit

CIRCUIT BLOCK	SECOND CHARACTER OF SYMBOL NO.	CIRCUIT BLOCK	SECOND CHARACTER OF SYMBOL NO.
Channel Management	0 or M	Horizontal	7 or H
Tuner	1 or T	CPT	8 or D
Signal	2 or S	Power	9 or P
Y-signal	3 or Y	Red	R
Audio	4 or A	Green	G
Color	5 or C	Blue	B
Vertical	6 or V	New & Others	EFJKLQUWXZ

SYMBOL NO.	PART NO.	PART DESCRIPTION
		CAPACITORS
CA01	0800003	EL 1MF 50V
CA02	0800003	EL 1MF 50V
CA03	0800003	EL 1MF 50V
CA04	0800003	EL 1MF 50V
CA05	0800003	EL 1MF 50V
CA06	0800003	EL 1MF 50V
CA07	0800003	EL 1MF 50V
CA08	0800003	EL 1MF 50V
CA26	0800015	EL 10MF 16V
CA27	0800015	EL 10MF 16V
CA28	0800015	EL 10MF 16V
CA29	0800015	EL 10MF 16V
CA30	0800015	EL 10MF 16V
CA31	0800015	EL 10MF 16V
CA32	0800015	EL 10MF 16V
CA33	0800015	EL 10MF 16V
CA34	0800015	EL 10MF 16V
CA35	0800015	EL 10MF 16V
CA36	0800015	EL 10MF 16V
CA37	0800015	EL 10MF 16V
CA38	0800041	EL 47MF 16V
CA39	0800041	EL 47MF 16V
CA40	0800015	EL 10MF 16V
CA41	0800015	EL 10MF 16V
CA70	0800041	EL 47MF 16V
CA71	0800015	EL 10MF 16V
CA72	0800015	EL 10MF 16V
CC02	0244171	CD 0.01MF +80-20% 50V
CC03	0890063	CD 15PF +-5% 50V
CC04	0244171	CD 0.01MF +80-20% 50V
CC05	0244171	CD 0.01MF +80-20% 50V
CC06	0800049	EL 100MF 16V
CC70	0244171	CD 0.01MF +80-20% 50V
CE01	0800074	EL 470MF 16V
CE02	0284621R	EL 0.47MF 50V
CE03	0800041	EL 47MF 16V
CE04	0890081R	CD 330PF +-10% 50V
CE05	0800049	EL 100MF 16V
CE06	0880044	PF 0.01MF +-10% 50V
CE07	0800049	EL 100MF 16V
CE08	0276717	PF 0.1MF 50V +-5%
CE09	0276717	PF 0.1MF 50V +-5%
CE10	0800042	EL 47MF 25V
CE11	0890074	CD 100PF +-5% 50V
CE12	0244541	CD 0.01MF +-10% 500V
CE13	0244541	CD 0.01MF +-10% 500V
CE14	0253959F	EL 47MF 160V
CE15	0247848	CD 56PF +-5% 500V
CE16	0253957	EL 22MF 160V
CE17	0244509	CD 4700PF +-10% 500V
CE18	0890074	CD 100PF +-5% 50V
CE19	0253959F	EL 47MF 160V
CE20	0253959F	EL 47MF 160V
CE21	0890077	CD 180PF +-10% 50V
CF01	0800317	EL 47MF 16V
CF02	0800353R	EL 470MF 16V
CF03	0252396	EL 10MF 16V
CF04	0800291	EL 10MF 16V
CF05	0276721	PF 0.22MF 50V +-5%
CF06	0800291	EL 10MF 16V
CF07	0880041	PF 5600PF +-10% 50V
CF08	0244120	CD 820PF +-10% 50V
CF09	0284642R	EL 10MF 50V
CF10	0890083	CD 470PF +-10% 50V
CF11	0800291	EL 10MF 16V
CF12	AN00062R	PF 0.01MF +-10% 50V (HHEA MD)
CF13	0890082R	CD 390PF +-10% 50V
CF14	0800353R	EL 470MF 16V
CF15	0252396	EL 10MF 16V
CF16	0800291	EL 10MF 16V
CF17	0244109	CD 4700PF +-10% 50V
CK01	0800326	EL 100MF 16V
CK02	0244141	CD 0.01MF +-10% 50V
CK03	0800326	EL 100MF 16V
CK04	0244141	CD 0.01MF +-10% 50V
CK05	AN00075R	PF 0.1MF +-10% 50V (HHEA MD)
CK06	0800326	EL 100MF 16V
CK07	0800326	EL 100MF 16V
CK08	AN00075R	PF 0.1MF +-10% 50V (HHEA MD)
CK10	0800353R	EL 470MF 16V
CK11	0800058	EL 220MF 16V
CK13	AN00075	PF 0.1MF +-10% 50V (HHEA MD)
CK14	AN00075	PF 0.1MF +-10% 50V (HHEA MD)
CK15	0248688	CD 150PF +-5% 50V
CK17	0248688	CD 150PF +-5% 50V
CK19	0248688	CD 150PF +-5% 50V
CK21	0248688	CD 150PF +-5% 50V
CK23	0248688	CD 150PF +-5% 50V

PRODUCT SAFETY NOTE: Components marked with a ⚠ have special characteristics important to safety. Before replacing any of these components, read carefully, the PRODUCT SAFETY NOTICE of this Service Manual. Don't degrade the safety of the receiver through improper servicing.

SYMBOL NO.	PART NO.	PART DESCRIPTION
CK25	0248688	CD 150PF +-5% 50V
CK27	0258175	EL 470MF 50V
CK28	0258175	EL 470MF 50V
CK29	0248688	CD 150PF +-5% 50V
CK30	0248688	CD 150PF +-5% 50V
CK31	0248688	CD 150PF +-5% 50V
CK32	0248688	CD 150PF +-5% 50V
CK33	0248688	CD 150PF +-5% 50V
CK34	0248688	CD 150PF +-5% 50V
CK41	0248688	CD 150PF +-5% 50V
CK42	0880031	PF 1000PF +-10% 50V
CK45	0880042	PF 6800PF +-10% 50V
CK46	0880044	PF 0.01MF +-10% 50V
CK47	0880044	PF 0.01MF +-10% 50V
CK51	0800321	EL 47MF 50V
CK52	0800321	EL 47MF 50V
CK53	0800321	EL 47MF 50V
CK54	0800321	EL 47MF 50V
CK55	0800321	EL 47MF 50V
CK56	0800321	EL 47MF 50V
CL01	0880053	PF 0.047MF +-10% 50V
CL02	0880053	PF 0.047MF +-10% 50V
CL03	0880053	PF 0.047MF +-10% 50V
CL04	0880053	PF 0.047MF +-10% 50V
CL05	0880053	PF 0.047MF +-10% 50V
CL06	0880053	PF 0.047MF +-10% 50V
CL07	0880053	PF 0.047MF +-10% 50V
CL08	0880053	PF 0.047MF +-10% 50V
CL09	0800049	EL 100MF 16V
CL10	0880057	PF 0.1MF +-10% 50V
CM01	0800023	EL 22MF 16V
CM02	0244171	CD 0.01MF +80-20% 50V
CM03	0800003	EL 1MF 50V
CM04	0244171	CD 0.01MF +80-20% 50V
CM05	0244171	CD 0.01MF +80-20% 50V
CN01	0800279	EL 1MF 50V
CN02	0800288	EL 4.7MF 50V
CN03	0880051	PF 0.033MF +-10% 50V
CN04	0890084	CD 560PF +-10% 50V
CN05	0800041	EL 47MF 16V
CN06	0800018	EL 10MF 50V
CSA1	0800049	EL 100MF 16V
CSA2	0276717	PF 0.1MF 50V +-5%
CSA3	0276717	PF 0.1MF 50V +-5%
CSA5	0284638	EL 10MF 16V
CSA6	0284638	EL 10MF 16V
CSA7	0800042	EL 47MF 25V
CSA8	0880203	PF 0.47MF +-5% 50V
CSA9	0880053	PF 0.047MF +-10% 50V
CSB1	0800015	EL 10MF 16V
CSB2	0276717	PF 0.1MF 50V +-5%
CSC1	0284638R	EL 10MF 16V
CSC2	0284638R	EL 10MF 16V
CSC3	0284638R	EL 10MF 16V
CSC4	0800074N	EL 470MF 16V
CSC5	0880044R	PF 0.01MF 50V
CSC6	0800105R	EL 0.33MF 50V
CSC7	0284638R	EL 10MF 16V
CSC8	0800041R	EL 47MF 16V
CSC9	0800003R	EL 1MF 50V
CSE1	0284638R	EL 10MF 16V
CSE2	0284638R	EL 10MF 16V
CSE3	0880044R	PF 0.01MF 50V
CSE4	0800105R	EL 0.33MF 50V
CSE5	0284638R	EL 10MF 16V
CSE6	0800048R	EL 100MF 10V
CSE7	0284638R	EL 10MF 16V
CSE8	0284638R	EL 10MF 16V
CSE9	0800015R	EL 10MF 16V
CSF1	0284638R	EL 10MF 16V
CSF2	0800023R	EL 22MF 16V
CSF3	0800009R	EL 4.7MF 25V
CSF5	0800015R	EL 10MF 16V
CSF6	0284638R	EL 10MF 16V
CSF7	0800023R	EL 22MF 16V
CSF8	0800009R	EL 4.7MF 25V
CSF9	0284638R	EL 10MF 16V
CSG1	0800015R	EL 10MF 16V
CSG2	0284638R	EL 10MF 16V
CSG3	0800023R	EL 22MF 16V
CSG4	0800009R	EL 4.7MF 25V
CSG5	0284638R	EL 10MF 16V
CSG6	0284638R	EL 10MF 16V
CSG7	0284638R	EL 10MF 16V
CSG8	0800074N	EL 470MF 16V
CSG9	0880044R	PF 0.01MF 50V
CSH1	0800105R	EL 0.33MF 50V
CSH2	0284638R	EL 10MF 16V
CSH3	0800041R	EL 47MF 16V
CSH4	0800003R	EL 1MF 50V
CSH5	0284638R	EL 10MF 16V
CSH6	0284638R	EL 10MF 16V
CSH7	0880044R	PF 0.01MF 50V
CSH8	0800105R	EL 0.33MF 50V
CSH9	0284638R	EL 10MF 16V
CSJ1	0800048R	EL 100MF 10V
CSJ2	0800041R	EL 47MF 16V
CSJ3	0800041R	EL 47MF 16V
CSJ4	0800015R	EL 10MF 16V
CSJ5	0800015R	EL 10MF 16V
CSJ6	0800015R	EL 10MF 16V
CSJ7	0800015R	EL 10MF 16V
CSJ8	0800015R	EL 10MF 16V
CSJ9	0800015R	EL 10MF 16V
CSK1	0800015R	EL 10MF 16V
CS01	0880012	PF 0.022MF +-10% 50V
CS02	0880014	PF 0.047MF +-10% 50V
CS03	0800058	EL 220MF 16V
CS04	0800015	EL 10MF 16V
CS05	0800015	EL 10MF 16V
CS06	0800015	EL 10MF 16V
CS07	0800015	EL 10MF 16V
CS09	0284623	EL 1MF 50V
CS10	0284623	EL 1MF 50V
CS11	0276717	PF 0.1MF 50V +-5%
CS12	0276717	PF 0.1MF 50V +-5%
CS13	0800001	EL 0.47MF 50V
CS14	0800009	EL 4.7MF 25V
CS15	0800001	EL 0.47MF 50V
CS16	0800009	EL 4.7MF 25V
CS17	0880017	PF 0.15MF +-10% 50V
CS18	0800007	EL 3.3MF 50V
CS19	0880017	PF 0.15MF +-10% 50V
CS20	0880017	PF 0.15MF +-10% 50V
CS21	0800007	EL 3.3MF 50V
CS22	0880017	PF 0.15MF +-10% 50V
CS23	0800012	EL 4.7MF 50V
CS24	0800001	EL 0.47MF 50V
CS25	0800009	EL 4.7MF 25V
CS26	0800001	EL 0.47MF 50V
CS27	0276717	PF 0.1MF 50V +-5%
CS28	0276717	PF 0.1MF 50V +-5%
CS29	0800041	EL 47MF 16V
CS30	0880203R	PF 0.47MF +-5% 50V
CS31	0284638	EL 10MF 16V
CS33	0800015	EL 10MF 16V
CS34	0800015	EL 10MF 16V
CS35	0890085	CD 680PF +-10% 50V
CS36	0276717	PF 0.1MF 50V +-5%
CS37	0800074	EL 470MF 16V
CS38	0800005	EL 2.2MF 50V
CS39	0800058	EL 220MF 16V
CS40	0284623R	EL 1MF 50V
CS41	0284623R	EL 1MF 50V

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SYMBOL NO.	PART NO.	PART DESCRIPTION	SYMBOL NO.	PART NO.	PART DESCRIPTION
CS44	0244171	CD 0.01MF +80-20% 50V	CX02	0890065	CD 22PF +-5% 50V
CS45	0800015	EL 10MF 16V	CX03	0890061R	CD 10PF +-0.5% 50V
CS46	0284638	EL 10MF 16V	CX04	0890064	CD 18PF +-5% 50V
CS47	0800058	EL 220MF 16V	CX05	0800049	EL 100MF 16V
CS48	0800015	EL 10MF 16V	CX06	0800009	EL 4.7MF 25V
CS49	0800015	EL 10MF 16V	CX07	0880031	PF 1000PF +-10% 50V
CS50	0800003	EL 1MF 50V	CX08	0890071	CD 56PF +-5% 50V
CS51	0880051	PF 0.033MF +-10% 50V	CX09	0880044	PF 0.01MF +-10% 50V
CS52	0890089	CD 1500PF +-10% 50V	CX10	0800005	EL 2.2MF 50V
CS53	0880051	PF 0.033MF +-10% 50V	CX11	0800009	EL 4.7MF 25V
CS54	0800058	EL 220MF 16V	CX12	0244171	CD 0.01MF +80-20% 50V
CS55	0246451	CD 30PF +-5% 50V	CX13	0246443	CD 13PF +-5% 50V
CS56	0246451	CD 30PF +-5% 50V	CX14	0880044	PF 0.01MF +-10% 50V
CS58	0800015	EL 10MF 16V	CX15	0284621R	EL 0.47MF 50V
CS59	0800051	EL 100MF 25V	CX16	0890089	CD 1500PF +-10% 50V
CS60	0800003	EL 1MF 50V	CX17	0890082R	CD 390PF +-10% 50V
CS61	0800042	EL 47MF 25V	CX18	0890074	CD 100PF +-5% 50V
CS62	0800051	EL 100MF 25V	CX19	0890087	CD 1000PF +-10% 50V
CS63	0800042	EL 47MF 25V	CX20	0800009	EL 4.7MF 25V
CS64	0800003	EL 1MF 50V	CX21	0890109	CD 6PF +-0.5% 50V
CS65	0800003	EL 1MF 50V	CX22	0244171	CD 0.01MF +80-20% 50V
CS66	0800003	EL 1MF 50V	CX23	0800048	EL 100MF 10V
CS67	0800003	EL 1MF 50V	CX24	0244171	CD 0.01MF +80-20% 50V
CS68	0800003	EL 1MF 50V	CX25	0244171	CD 0.01MF +80-20% 50V
CS69	0800003	EL 1MF 50V	CX26	0244171	CD 0.01MF +80-20% 50V
CS70	0890087	CD 1000PF +-10% 50V	CX27	0800009	EL 4.7MF 25V
CS71	0890087	CD 1000PF +-10% 50V	CX28	0244171	CD 0.01MF +80-20% 50V
CS72	0890087	CD 1000PF +-10% 50V	CX29	0880053	PF 0.047MF +-10% 50V
CS73	0800042	EL 47MF 25V	CX30	0244171	CD 0.01MF +80-20% 50V
CS74	0800042	EL 47MF 25V	CX31	0248690	CD 180PF +-5% 50V
CS75	0800084	EL 1000MF 35V	CX32	0880044	PF 0.01MF +-10% 50V
CS76	0800051	EL 100MF 25V	CX33	0244171	CD 0.01MF +80-20% 50V
CS77	0880018	PF 0.22MF +-10% 50V	CX34	0800048	EL 100MF 10V
CS78	0800003	EL 1MF 50V	CX35	0880044	PF 0.01MF +-10% 50V
CS79	0800015	EL 10MF 16V	CX36	0800048	EL 100MF 10V
CS80	0800015	EL 10MF 16V	CX37	0244171	CD 0.01MF +80-20% 50V
CS81	0800015	EL 10MF 16V	CX38	0244171	CD 0.01MF +80-20% 50V
CS82	0276717	PF 0.1MF 50V +-5%	CX39	0244171	CD 0.01MF +80-20% 50V
CS83	0276717	PF 0.1MF 50V +-5%	CX40	0244171	CD 0.01MF +80-20% 50V
CS84	0276717	PF 0.1MF 50V +-5%	CX41	0244171	CD 0.01MF +80-20% 50V
CS85	0800083	EL 1000MF 25V	CX42	0800057	EL 220MF 10V
CS86	0800083	EL 1000MF 25V	CX45	0800015	EL 10MF 16V
CS87	0800083	EL 1000MF 25V	CX46	0800049	EL 100MF 16V
CS88	0800049R	EL 100MF 16V	CX47	0800049	EL 100MF 16V
CS89	0800041R	EL 47MF 16V	CX48	0880044	PF 0.01MF +-10% 50V
CS90	0276717R	PF 0.1MF 50V +-5%	CX49	0800049	EL 100MF 16V
CS91	0800041R	EL 47MF 16V	CX50	0800048	EL 100MF 10V
CS92	0276717R	PF 0.1MF 50V +-5%	CX52	0800048	EL 100MF 10V
CS93	0284638R	EL 10MF 16V	CX53	0880044	PF 0.01MF +-10% 50V
CS94	0800041R	EL 47MF 16V	CX54	0284647R	EL 22MF 16V
CS95	0284638R	EL 10MF 16V	CY01	0800023	EL 22MF 16V
CS96	0800015R	EL 10MF 16V	CY04	0800023	EL 22MF 16V
CS97	0800049R	EL 100MF 16V	CY05	0800023	EL 22MF 16V
CS98	0800015R	EL 10MF 16V	CY06	0800023	EL 22MF 16V
CS99	0284623R	EL 1MF 50V	CY07	0800023	EL 22MF 16V
CW09	0800049	EL 100MF 16V	CY08	0800049	EL 100MF 16V
CW10	0800023	EL 22MF 16V	CY09	0276717	PF 0.1MF 50V +-5%
CW11	0284623R	EL 1MF 50V	CY10	0800015	EL 10MF 16V
CW12	0800003	EL 1MF 50V	CY11	0800015	EL 10MF 16V
CW13	0800012	EL 4.7MF 50V	CY12	0800049	EL 100MF 16V
CW14	0284638	EL 10MF 16V	CY13	0890089	CD 1500PF +-10% 50V
CW15	0276717	PF 0.1MF 50V +-5%	CY14	0800074	EL 470MF 16V
CW16	0880053	PF 0.047MF +-10% 50V	CY15	0276717	PF 0.1MF 50V +-5%
CW17	0800001	EL 0.47MF 50V	CY16	0800049	EL 100MF 16V
CW18	0276717	PF 0.1MF 50V +-5%	CY17	0800041	EL 47MF 16V
CW19	0800003	EL 1MF 50V	CY70	0800015	EL 10MF 16V
CW20	0800003	EL 1MF 50V	CY71	0800015	EL 10MF 16V
CW21	0800003	EL 1MF 50V	CY72	0244171	CD 0.01MF +80-20% 50V
CW22	0800007	EL 3.3MF 50V	C001	0276717	PF 0.1MF 50V +-5%
CW23	0800015	EL 10MF 16V	C002	0800047	EL 100MF 6.3V
CW24	0800003	EL 1MF 50V	C003	0276717	PF 0.1MF 50V +-5%
CW25	0800003	EL 1MF 50V	C004	0890067	CD 33PF +-5% 50V
CX01	0800041	EL 47MF 16V	C005	0244171	CD 0.01MF +80-20% 50V

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SYMBOL NO.	PART NO.	PART DESCRIPTION
C006	0800015	EL 10MF 16V
C007	0890067	CD 33PF +-5% 50V
C010	0800009	EL 4.7MF 25V
C011	0800009	EL 4.7MF 25V
C012	0800009	EL 4.7MF 25V
C013	0800009	EL 4.7MF 25V
C014	0800009	EL 4.7MF 25V
C015	0880012	PF 0.022MF +-10% 50V
C016	0800009	EL 4.7MF 25V
C017	0800009	EL 4.7MF 25V
C018	0800047	EL 100MF 6.3V
C019	0276717	PF 0.1MF 50V +-5%
C020	0890085	CD 680PF +-10% 50V
C021	0800015	EL 10MF 16V
C022	0243503R	CD 150PF +-10% 500V
C023	0890074	CD 100PF +-5% 50V
C024	0890087	CD 1000PF +-10% 50V
C025	0800047	EL 100MF 6.3V
C026	0276717	PF 0.1MF 50V +-5%
C027	0800023	EL 22MF 16V
C031	0800048	EL 100MF 10V
C032	0800015	EL 10MF 16V
C034	0800074	EL 470MF 16V
C035	0276717	PF 0.1MF 50V +-5%
C036	0800009	EL 4.7MF 25V
C037	0800049	EL 100MF 16V
C038	0276717	PF 0.1MF 50V +-5%
C039	0800075	EL 470MF 25V
C040	0243503	CD 150PF +-10% 500V
C041	0800003	EL 1MF 50V
C042	0800003	EL 1MF 50V
C043	0800051	EL 100MF 25V
C044	0800015	EL 10MF 16V
C045	0880018	PF 0.22MF +-10% 50V
C046	0800005	EL 2.2MF 50V
C301	0276717	PF 0.1MF 50V +-5%
C302	0800015	EL 10MF 16V
C303	0800007	EL 3.3MF 50V
C305	0800003	EL 1MF 50V
C306	0244171	CD 0.01MF +80-20% 50V
C307	0244171	CD 0.01MF +80-20% 50V
C308	0244171	CD 0.01MF +80-20% 50V
C309	0244171	CD 0.01MF +80-20% 50V
C310	0244171	CD 0.01MF +80-20% 50V
C311	0244171	CD 0.01MF +80-20% 50V
C313	0800015	EL 10MF 16V
C314	0800003	EL 1MF 50V
C315	0244171	CD 0.01MF +80-20% 50V
C317	0800003	EL 1MF 50V
C318	0800003	EL 1MF 50V
C319	0800005	EL 2.2MF 50V
C323	0880046	PF 0.015MF +-10% 50V
C324	0800003	EL 1MF 50V
C325	0880033	PF 1500PF +-10% 50V
C326	0800003	EL 1MF 50V
C327	0800049	EL 100MF 16V
C328	0244171	CD 0.01MF +80-20% 50V
C329	0800009	EL 4.7MF 25V
C330	0800049	EL 100MF 16V
C331	0800058	EL 220MF 16V
C332	0800015	EL 10MF 16V
C333	0880046	PF 0.015MF +-10% 50V
C334	0880051	PF 0.033MF +-10% 50V
C335	0880037	PF 3300PF +-10% 50V
C336	0276717	PF 0.1MF 50V +-5%
C337	0880037	PF 3300PF +-10% 50V
C338	0890079R	CD 270PF +-10% 50V
C339	0880037	PF 3300PF +-10% 50V
C340	0800003	EL 1MF 50V
C406	0890087	CD 1000PF +-10% 50V
C407	0284638R	EL 10MF 16V
C411	0284638R	EL 10MF 16V
C427	0800003	EL 1MF 50V
C428	0800003	EL 1MF 50V
C432	0800015	EL 10MF 16V
C433	0800003	EL 1MF 50V
C434	0800003	EL 1MF 50V
C435	0890087	CD 1000PF +-10% 50V
C436	0890087	CD 1000PF +-10% 50V
C437	0800042	EL 47MF 25V
C438	0800042	EL 47MF 25V
C439	0800051	EL 100MF 25V
C440	0800003	EL 1MF 50V
C441	0800003	EL 1MF 50V
C442	0800051	EL 100MF 25V
C443	0253934	EL 2200MF 35V
C444	0276717	PF 0.1MF 50V +-5%
C445	0276717	PF 0.1MF 50V +-5%
C446	0253934	EL 2200MF 35V
C447	0253934	EL 2200MF 35V
C448	0800041	EL 47MF 16V
C449	0276717	PF 0.1MF 50V +-5%
C450	0880018	PF 0.22MF +-10% 50V
C453	0258616	EL 2.2MF 50V
C454	0258616	EL 2.2MF 50V
C459	0880057	PF 0.1MF +-10% 50V
C501	0800001	EL 0.47MF 50V
C502	0244171	CD 0.01MF +80-20% 50V
C503	0244171	CD 0.01MF +80-20% 50V
C504	0800058	EL 220MF 16V
C505	0890116	CD 15PF +-5% 50V
C507	0800003	EL 1MF 50V
C508	0800003	EL 1MF 50V
C509	0800003	EL 1MF 50V
C511	0244171	CD 0.01MF +80-20% 50V
C512	0244171	CD 0.01MF +80-20% 50V
C513	0244171	CD 0.01MF +80-20% 50V
C515	0244171	CD 0.01MF +80-20% 50V
C516	0244171	CD 0.01MF +80-20% 50V
C519	0800015	EL 10MF 16V
C521	0244171	CD 0.01MF +80-20% 50V
C525	0880044	PF 0.01MF +-10% 50V
C526	0276717	PF 0.1MF 50V +-5%
C527	0800075	EL 470MF 25V
C528	0276717	PF 0.1MF 50V +-5%
C529	0276717	PF 0.1MF 50V +-5%
C530	0800075	EL 470MF 25V
C531	0276717	PF 0.1MF 50V +-5%
C532	0276717	PF 0.1MF 50V +-5%
C533	0800075	EL 470MF 25V
C534	0276717	PF 0.1MF 50V +-5%
C536	0800075	EL 470MF 25V
C603	0800345	EL 330MF 25V
C604	AN00062R	PF 0.01MF +-10% 50V (HHEA MD)
C606	0298261R	TA 1MF +-10% 35V
C607	0284446R	EL 1MF 50V
C608	0800368	EL 2200MF 25V
C609	0800347N	EL 330MF 50V
C610	0800326	EL 100MF 16V
C611	0800347N	EL 330MF 50V
C612	0880051	PF 0.033MF +-10% 50V
C613	AN00062R	PF 0.01MF +-10% 50V (HHEA MD)
C614	0279859	PF 0.1MF +-10% 100V
C617	0284446R	EL 1MF 50V
C618	0284449R	EL 4.7MF 50V
C619	AN00062R	PF 0.01MF +-10% 50V (HHEA MD)
C620	0800291	EL 10MF 16V
C622	0800041	EL 47MF 16V
C623	0800041	EL 47MF 16V
C701	AN00062R	PF 0.01MF +-10% 50V (HHEA MD)
C702	0243507	CD 330PF +-10% 500V
C703	0244501	CD 1000PF +-10% 500V
C704	0259153	EL 220MF 160V
C705	0299926	PP 0.1MF +-10% 200V
C706	0890028	CD 330PF +-10% 50V
⚠ C708	0262414F	PP 3300PF +-5% 1800V (HHEA MD)

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SYMBOL NO.	PART NO.	PART DESCRIPTION	SYMBOL NO.	PART NO.	PART DESCRIPTION
⚠ C709	0262426F	PP 9100PF +-5% 1.8KV	C947	0258121R	EL 2.2MF 100V
C710	0299931	PP 0.27MF +-10% 200V	C954	0800363	EL 1000MF 35V
C711	0299931	PP 0.27MF +-10% 200V	C955	0800317	EL 47MF 16V
⚠ C715	0299720	PP 0.015MF +-5% 630V	C956	0800082	EL 1000MF 16V
C717	0259471	EL 6.8MF 50V	C957	0800331R	EL 100MF 63V
C718	0299636	PP 0.068MF +-5% 1600V	C958	0800331R	EL 100MF 63V
C720	0243503	CD 150PF +-10% 500V	C960	0880057	PF 0.1MF +-10% 50V
C721	0253983F	EL 33MF	C967	0880062	PF 0.22MF +-10% 50V
C722	0800329	EL 100MF 50V	C968	0880062	PF 0.22MF +-10% 50V
C723	0880057	PF 0.1MF +-10% 50V	C969	0880062	PF 0.22MF +-10% 50V
C724	0890087	CD 1000PF +-10% 50V	C972	0800291	EL 10MF 16V
C725	0800279R	EL 1MF 50V	C973	0800083	EL 1000MF 25V
C726	0244109	CD 4700PF +-10% 50V			
C727	0880048	PF 0.022MF +-10% 50V			**RESISTORS**
C728	0890089	CD 1500PF +-10% 50V			
C729	0800282	EL 2.2MF 50V	RA01	0700051	CF 5.6K OHM +-5% 1/16W
C730	0284634R	EL 4.7MF 50V	RA02	0700051	CF 5.6K OHM +-5% 1/16W
C731	0244501	CD 1000PF +-10% 500V	RA03	0700051	CF 5.6K OHM +-5% 1/16W
C732	0243508	CD 390PF +-10% 500V	RA04	0700051	CF 5.6K OHM +-5% 1/16W
C735	0880031	PF 1000PF +-10% 50V	RA05	0700051	CF 5.6K OHM +-5% 1/16W
C738	0243503	CD 150PF +-10% 500V	RA06	0700051	CF 5.6K OHM +-5% 1/16W
C739	0890083	CD 470PF +-10% 50V	RA07	0700051	CF 5.6K OHM +-5% 1/16W
C740	0890084	CD 560PF +-10% 50V	RA08	0700051	CF 5.6K OHM +-5% 1/16W
⚠ C741	0246348	CD 220PF +-10% 2KV (HHEA MD)	RA09	0700041	CF 1K OHM +-5% 1/16W
C804	0244889	CD 2200PF +-10% 2KV	RA10	0700041	CF 1K OHM +-5% 1/16W
C805	0800326	EL 100MF 16V	RA11	0700027	CF 100 OHM +-5% 1/16W
C807	0244139	CD 1000PF +-10% 50V	RA12	0700027	CF 100 OHM +-5% 1/16W
C808	0244139	CD 1000PF +-10% 50V	RA18	0700062	CF 39K OHM +-5% 1/16W
C810	0800326	EL 100MF 16V	RA19	0700054	CF 10K OHM +-5% 1/16W
C831	0257543	EL 3.3MF 315V	RA20	0700041	CF 1K OHM +-5% 1/16W
C834	0244889	CD 2200PF +-10% 2KV	RA21	0700041	CF 1K OHM +-5% 1/16W
C835	0800326	EL 100MF 16V	RA22	0700034	CF 330 OHM +-5% 1/16W
C837	0244139	CD 1000PF +-10% 50V	RA23	0700032	CF 220 OHM +-5% 1/16W
C838	0244139	CD 1000PF +-10% 50V	RA24	0700062	CF 39K OHM +-5% 1/16W
C864	0244889	CD 2200PF +-10% 2KV	RA25	0700054	CF 10K OHM +-5% 1/16W
C865	0800326	EL 100MF 16V	RA26	0700041	CF 1K OHM +-5% 1/16W
C867	0244139	CD 1000PF +-10% 50V	RA27	0700041	CF 1K OHM +-5% 1/16W
C868	0890086	CD 820PF +-10% 50V	RA28	0700034	CF 330 OHM +-5% 1/16W
⚠ C901	AN00148S	PF 0.22MF +-20% 250V (HHEA MD)	RA29	0700032	CF 220 OHM +-5% 1/16W
⚠ C902	AN00144S	PF 0.1MF +-20% 250V (HHEA MD)	RA30	0700041	CF 1K OHM +-5% 1/16W
C903	0248593F	CD 4700PF +80-20% 250V	RA31	0700067	CF 100K OHM +-5% 1/16W
C904	0248593F	CD 4700PF +80-20% 250V	RA32	0700041	CF 1K OHM +-5% 1/16W
C905	0248593F	CD 4700PF +80-20% 250V	RA33	0700067	CF 100K OHM +-5% 1/16W
C906	0248593F	CD 4700PF +80-20% 250V	RA34	0700062	CF 39K OHM +-5% 1/16W
C907	0259167	EL 820MF 200V	RA35	0700054	CF 10K OHM +-5% 1/16W
C908	0259167	EL 820MF 200V	RA36	0700041	CF 1K OHM +-5% 1/16W
C911	0890087	CD 1000PF +-10% 50V	RA37	0700041	CF 1K OHM +-5% 1/16W
C912	0800059	EL 220MF 25V	RA38	0700034	CF 330 OHM +-5% 1/16W
C913	0299981	PP 0.01MF +-5% 630V	RA39	0700032	CF 220 OHM +-5% 1/16W
C914	0880044	PF 0.01MF +-10% 50V	RA40	0700062	CF 39K OHM +-5% 1/16W
C915	0880037	PF 3300PF +-10% 50V	RA41	0700054	CF 10K OHM +-5% 1/16W
C916	0880031	PF 1000PF +-10% 50V	RA42	0700041	CF 1K OHM +-5% 1/16W
C917	0800286R	EL 4.7MF 25V	RA43	0700041	CF 1K OHM +-5% 1/16W
C918	0880057	PF 0.1MF +-10% 50V	RA44	0700034	CF 330 OHM +-5% 1/16W
C920	0285221	EL 1000MF 35V	RA45	0700032	CF 220 OHM +-5% 1/16W
C921	0285221	EL 1000MF 35V	RA46	0700041	CF 1K OHM +-5% 1/16W
C922	0285221	EL 1000MF 35V	RA47	0700067	CF 100K OHM +-5% 1/16W
C924	0285224	EL 2200MF 25V	RA48	0700041	CF 1K OHM +-5% 1/16W
C925	0285224	EL 2200MF 25V	RA49	0700067	CF 100K OHM +-5% 1/16W
C926	0258697	EL 470MF 160V	RA50	0700041	CF 1K OHM +-5% 1/16W
C927	0880044	PF 0.01MF +-10% 50V	RA51	0700067	CF 100K OHM +-5% 1/16W
C928	0244105	CD 2200PF +-10% 50V	RA52	0700041	CF 1K OHM +-5% 1/16W
C930	0284436R	EL 100MF 35V	RA53	0700067	CF 100K OHM +-5% 1/16W
C931	0284436R	EL 100MF 35V	RA54	0700041	CF 1K OHM +-5% 1/16W
C933	0800326	EL 100MF 16V	RA55	0700067	CF 100K OHM +-5% 1/16W
C935	0284436R	EL 100MF 35V	RA56	0700041	CF 1K OHM +-5% 1/16W
C936	0284405R	EL 220MF 16V	RA57	0700067	CF 100K OHM +-5% 1/16W
C937	0284405R	EL 220MF 16V	RA58	0700041	CF 1K OHM +-5% 1/16W
C939	0284436R	EL 100MF 35V	RA59	0700067	CF 100K OHM +-5% 1/16W
C942	0800326	EL 100MF 16V	RA60	0700041	CF 1K OHM +-5% 1/16W
C943	0800279R	EL 1MF 50V	RA61	0700067	CF 100K OHM +-5% 1/16W
C944	0800317	EL 47MF 16V	RA62	0700041	CF 1K OHM +-5% 1/16W
C945	0284647R	EL 22MF 16V	RA63	0700041	CF 1K OHM +-5% 1/16W

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SYMBOL NO.	PART NO.	PART DESCRIPTION
RA64	0100123	CF 270K OHM +-5% 1/8W
RA65	0100123	CF 270K OHM +-5% 1/8W
RA66	0100123	CF 270K OHM +-5% 1/8W
RA67	0100123	CF 270K OHM +-5% 1/8W
RA71	0100041	CF 100 OHM +-5% 1/8W
RA72	0700041	CF 1K OHM +-5% 1/16W
RA73	0700041	CF 1K OHM +-5% 1/16W
RA74	0700064	CF 56K OHM +-5% 1/16W
RA75	0700045	CF 2.2K OHM +-5% 1/16W
RA76	0100123	CF 270K OHM +-5% 1/8W
RA77	0700047	CF 3.3K OHM +-5% 1/16W
RA78	0700064	CF 56K OHM +-5% 1/16W
RA79	0100123	CF 270K OHM +-5% 1/8W
RA80	0700041	CF 1K OHM +-5% 1/16W
RA81	0700041	CF 1K OHM +-5% 1/16W
RA82	0100041	CF 100 OHM +-5% 1/8W
RA89	0700054	CF 10K OHM +-5% 1/16W
RA90	0700054	CF 10K OHM +-5% 1/16W
RC01	0700027	CF 100 OHM +-5% 1/16W
RC02	0700027	CF 100 OHM +-5% 1/16W
RC03	0700027	CF 100 OHM +-5% 1/16W
RC04	0700027	CF 100 OHM +-5% 1/16W
RC05	0700027	CF 100 OHM +-5% 1/16W
RC06	0700037	CF 560 OHM +-5% 1/16W
RC07	0700032	CF 220 OHM +-5% 1/16W
RC08	0700032	CF 220 OHM +-5% 1/16W
RC09	0700056	CF 15K OHM +-5% 1/16W
RC10	0700055	CF 12K OHM +-5% 1/16W
RC11	0700027	CF 100 OHM +-5% 1/16W
RC12	0700027	CF 100 OHM +-5% 1/16W
RC13	0700053	CF 8.2K OHM +-5% 1/16W
RC14	0700057	CF 18K OHM +-5% 1/16W
RC15	0700041	CF 1K OHM +-5% 1/16W
RC16	0100038	CF 75 OHM +-5% 1/8W
RC17	0100041	CF 100 OHM +-5% 1/8W
RC18	0700027	CF 100 OHM +-5% 1/16W
RC19	0700039	CF 820 OHM +-5% 1/16W
RC71	0187038	CF 75 OHM +-5% 1/16W
RE01	0110135	MF 390 OHM +-5% 1W
RE02	0700067	CF 100K OHM +-5% 1/16W
RE03	0700059	CF 27K OHM +-5% 1/16W
RE04	0700035	CF 390 OHM +-5% 1/16W
RE05	0700042	CF 1.2K OHM +-5% 1/16W
RE06	0700036	CF 470 OHM +-5% 1/16W
RE07	0700067	CF 100K OHM +-5% 1/16W
RE08	0700059	CF 27K OHM +-5% 1/16W
RE09	0700042	CF 1.2K OHM +-5% 1/16W
RE10	0700033	CF 270 OHM +-5% 1/16W
RE11	0700033	CF 270 OHM +-5% 1/16W
RE12	0700045	CF 2.2K OHM +-5% 1/16W
RE13	0700058	CF 22K OHM +-5% 1/16W
RE14	0700067	CF 100K OHM +-5% 1/16W
RE15	0700046	CF 2.7K OHM +-5% 1/16W
RE16	0113742	CF 470 OHM +-5% 1/2W
RE17	0700061	CF 33K OHM +-5% 1/16W
RE18	0700036	CF 470 OHM +-5% 1/16W
RE19	0700067	CF 100K OHM +-5% 1/16W
RE20	0700054	CF 10K OHM +-5% 1/16W
RE21	0100065	CF 1K OHM +-5% 1/8W
RE22	0700024	CF 56 OHM +-5% 1/16W
RE23	0113701	CF 10 OHM +-5% 1/2W
RE24	0100039	CF 82 OHM +-5% 1/8W
RE25	0114165	CF 1.5K OHM +-5% 1/4W
RE26	0114143	CF 330 OHM +-5% 1/4W
RE27	0114221	CF 68K OHM +-5% 1/4W
RE28	0114221	CF 68K OHM +-5% 1/4W
RE29	0113776	CF 12K OHM +-5% 1/2W
RE30	0100039	CF 82 OHM +-5% 1/8W
RE31	0100069	CF 1.5K OHM +-5% 1/8W
RE32	0100053	CF 330 OHM +-5% 1/8W
RE33	0113716	CF 43 OHM +-5% 1/2W
RE34	0110229	MF 220 OHM +-5% 2W
RE36	0113686	CF 2.7 OHM +-5% 1/2W
RE37	0113716	CF 43 OHM +-5% 1/2W
RE38	0110132	MF 300 OHM +-5% 1W
RE39	0700054	CF 10K OHM +-5% 1/16W
RE40	0700049	CF 4.7K OHM +-5% 1/16W
RF01	0110279	MF 27K OHM +-5% 2W
RF02	0110279	MF 27K OHM +-5% 2W
RF03	0110279	MF 27K OHM +-5% 2W
RF04	0110279	MF 27K OHM +-5% 2W
RF05	0110279	MF 27K OHM +-5% 2W
RF06	0114213	CF 33K OHM +-5% 1/4W
RF07	0100065	CF 1K OHM +-5% 1/8W
RF08	0100041	CF 100 OHM +-5% 1/8W
RF09	0700032	CF 220 OHM +-5% 1/16W (60SX10BA/11KA, 50SX7PA)
RF09	0700035	CF 390 OHM +-5% 1/16W (46UX20BA/21KA, 50UX22BA/23KA)
RF10	0700045	CF 2.2K OHM +-5% 1/16W
RF11	0700059	CF 27K OHM +-5% 1/16W
RF12	0700059	CF 27K OHM +-5% 1/16W
RF13	0700053	CF 8.2K OHM +-5% 1/16W
RF14	0700045	CF 2.2K OHM +-5% 1/16W
RF15	0700046	CF 2.7K OHM +-5% 1/16W
RF16	0700049	CF 4.7K OHM +-5% 1/16W
RF17	0700027	CF 100 OHM +-5% 1/16W
RF18	0700054	CF 10K OHM +-5% 1/16W
RF19	0700037	CF 560 OHM +-5% 1/16W
RF20	0700066	CF 82K OHM +-5% 1/16W
RF21	0700049	CF 4.7K OHM +-5% 1/16W
RF22	0700059	CF 27K OHM +-5% 1/16W
RF23	0700043	CF 1.5K OHM +-5% 1/16W
RF24	0700051	CF 5.6K OHM +-5% 1/16W
RF25	0700038	CF 680 OHM +-5% 1/16W
RF26	0187098	CF 24K OHM +-5% 1/16W
RF27	0700054	CF 10K OHM +-5% 1/16W
RF28	0100113	CF 100K OHM +-5% 1/8W
RF29	0700063	CF 47K OHM +-5% 1/16W
RF30	0700046	CF 2.7K OHM +-5% 1/16W
RF31	0700041	CF 1K OHM +-5% 1/16W
RF32	0700052	CF 6.8K OHM +-5% 1/16W
RF33	0700058	CF 22K OHM +-5% 1/16W
RF34	0700058	CF 22K OHM +-5% 1/16W
RF35	0700056	CF 15K OHM +-5% 1/16W
RF36	0700053	CF 8.2K OHM +-5% 1/16W
RF37	0700041	CF 1K OHM +-5% 1/16W
RF38	0700061	CF 33K OHM +-5% 1/16W
RF39	0700049	CF 4.7K OHM +-5% 1/16W
RF40	0700054	CF 10K OHM +-5% 1/16W
RF41	0700054	CF 10K OHM +-5% 1/16W
RKA4	0700052	CF CA01 800003 EL 1MF 50V
RKA5	0700044	CF 1.8K OHM +-5% 1/16W
RKA6	0700041	CF 1K OHM +-5% 1/16W
RKA7	0700041	CF 1K OHM +-5% 1/16W
RK01	0700063	CF 47K OHM +-5% 1/16W
RK02	0700049	CF 4.7K OHM +-5% 1/16W
RK03	0100125	CF 330K OHM +-5% 1/8W
RK05	0700054	CF 10K OHM +-5% 1/16W
RK06	0700054	CF 10K OHM +-5% 1/16W
RK07	0700027	CF 100 OHM +-5% 1/16W
RK08	0700027	CF 100 OHM +-5% 1/16W
RK09	0700027	CF 100 OHM +-5% 1/16W
RK10	0700041	CF 1K OHM +-5% 1/16W
RK11	0700041	CF 1K OHM +-5% 1/16W
RK12	0700041	CF 1K OHM +-5% 1/16W
RK13	0700063	CF 47K OHM +-5% 1/16W
RK14	0110229	MF 220 OHM +-5% 2W
RK15	0113694	CF 5.6 OHM +-5% 1/2W
RK16	0113694	CF 5.6 OHM +-5% 1/2W
RK17	0100077	CF 3.3K OHM +-5% 1/8W
RK18	0700063	CF 47K OHM +-5% 1/16W
RK19	0110225	MF 150 OHM +-5% 2W
RK20	0113692	CF 4.7 OHM +-5% 1/2W

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SYMBOL NO.	PART NO.	PART DESCRIPTION
RK22	0100077	CF 3.3K OHM +-5% 1/8W
RK23	0700063	CF 47K OHM +-5% 1/16W
RK24	0110229	MF 220 OHM +-5% 2W
RK25	0113698	CF 8.2 OHM +-5% 1/2W
RK26	0113698	CF 8.2 OHM +-5% 1/2W
RK27	0100077	CF 3.3K OHM +-5% 1/8W
RK28	0700063	CF 47K OHM +-5% 1/16W
RK29	0110225	MF 150 OHM +-5% 2W
RK30	0113696	CF 6.8 OHM +-5% 1/2W
RK31	0113696	CF 6.8 OHM +-5% 1/2W
RK32	0100077	CF 3.3K OHM +-5% 1/8W
RK33	0700063	CF 47K OHM +-5% 1/16W
RK34	0110229	MF 220 OHM +-5% 2W
RK35	0113696	CF 6.8 OHM +-5% 1/2W
RK36	0113696	CF 6.8 OHM +-5% 1/2W
RK37	0100077	CF 3.3K OHM +-5% 1/8W
RK38	0100077	CF 3.3K OHM +-5% 1/8W
RK39	0700063	CF 47K OHM +-5% 1/16W
RK40	0110225	MF 150 OHM +-5% 2W
RK41	0113692	CF 4.7 OHM +-5% 1/2W
RK42	0113692	CF 4.7 OHM +-5% 1/2W
RK57	0700041	CF 1K OHM +-5% 1/16W
RK58	0700041	CF 1K OHM +-5% 1/16W
RK79	0700046	CF 2.7K OHM +-5% 1/16W
RK80	0700046	CF 2.7K OHM +-5% 1/16W
RK81	0700046	CF 2.7K OHM +-5% 1/16W
RK82	0700046	CF 2.7K OHM +-5% 1/16W
RK83	0700046	CF 2.7K OHM +-5% 1/16W
RK84	0700046	CF 2.7K OHM +-5% 1/16W
RK85	0700048	CF 3.9K OHM +-5% 1/16W
RK86	0700047	CF 3.3K OHM +-5% 1/16W
RK89	0700046	CF 2.7K OHM +-5% 1/16W
RK90	0700052	CF 6.8K OHM +-5% 1/16W
RK91	0700054	CF 10K OHM +-5% 1/16W
RK94	0100057	CF 470 OHM +-5% 1/8W
RK95	0700046	CF 2.7K OHM +-5% 1/16W
RK96	0700046	CF 2.7K OHM +-5% 1/16W
RK97	0700042	CF 1.2K OHM +-5% 1/16W
RL10	0100129	CF 470K OHM +-5% 1/8W
RL11	0100129	CF 470K OHM +-5% 1/8W
RL12	0100129	CF 470K OHM +-5% 1/8W
RL13	0100129	CF 470K OHM +-5% 1/8W
RL14	0100129	CF 470K OHM +-5% 1/8W
RL15	0100129	CF 470K OHM +-5% 1/8W
RL16	0100129	CF 470K OHM +-5% 1/8W
RL17	0100129	CF 470K OHM +-5% 1/8W
RL20	0100133	CF 680K OHM +-5% 1/8W
RL21	0100121	CF 220K OHM +-5% 1/8W
RL22	0100133	CF 680K OHM +-5% 1/8W
RL23	0100129	CF 470K OHM +-5% 1/8W
RL24	0100133	CF 680K OHM +-5% 1/8W
RL25	0100121	CF 220K OHM +-5% 1/8W
RL26	0100133	CF 680K OHM +-5% 1/8W
RL27	0100129	CF 470K OHM +-5% 1/8W
RL30	0700027	CF 100 OHM +-5% 1/16W
RL31	0700027	CF 100 OHM +-5% 1/16W
RL32	0700027	CF 100 OHM +-5% 1/16W
RL33	0700027	CF 100 OHM +-5% 1/16W
RL34	0700027	CF 100 OHM +-5% 1/16W
RL35	0700027	CF 100 OHM +-5% 1/16W
RL36	0700027	CF 100 OHM +-5% 1/16W
RL37	0700027	CF 100 OHM +-5% 1/16W
RL38	0700049	CF 4.7K OHM +-5% 1/16W
RM01	0700041	CF 1K OHM +-5% 1/16W
RM02	0700058	CF 22K OHM +-5% 1/16W
RM03	0700045	CF 2.2K OHM +-5% 1/16W
RM04	0100065	CF 1K OHM +-5% 1/8W
RM05	0100065	CF 1K OHM +-5% 1/8W
RM06	0700041	CF 1K OHM +-5% 1/16W
RM07	0700043	CF 1.5K OHM +-5% 1/16W
RM08	0700046	CF 2.7K OHM +-5% 1/16W
RM09	0700049	CF 4.7K OHM +-5% 1/16W
RM10	0100129	CF 470K OHM +-5% 1/8W
RM11	0700041	CF 1K OHM +-5% 1/16W
RM12	0100125	CF 330K OHM +-5% 1/8W
RM13	0114149	CF 560 OHM +-5% 1/4W
RM14	0100125	CF 330K OHM +-5% 1/8W
RM15	0700054	CF 10K OHM +-5% 1/16W
RN01	0700057	CF 18K OHM +-5% 1/16W
RN02	0700041	CF 1K OHM +-5% 1/16W
RN03	0700041	CF 1K OHM +-5% 1/16W
RN04	0700067	CF 100K OHM +-5% 1/16W
RN05	0700052	CF 6.8K OHM +-5% 1/16W
RN06	0700051	CF 5.6K OHM +-5% 1/16W
RN07	0700054	CF 10K OHM +-5% 1/16W
RN08	0700057	CF 18K OHM +-5% 1/16W
RN09	0700061	CF 33K OHM +-5% 1/16W
RN10	0700054	CF 10K OHM +-5% 1/16W
RN11	0700058	CF 22K OHM +-5% 1/16W
RN12	0700051	CF 5.6K OHM +-5% 1/16W
RN13	0700044	CF 1.8K OHM +-5% 1/16W
RN14	0700054	CF 10K OHM +-5% 1/16W
RN15	0700058	CF 22K OHM +-5% 1/16W
RN16	0700064	CF 56K OHM +-5% 1/16W
RN18	0700057	CF 18K OHM +-5% 1/16W
RN19	0700049	CF 4.7K OHM +-5% 1/16W
RSA1	0700041M	CF 1K OHM +-5% 1/16W
RSA2	0700041M	CF 1K OHM +-5% 1/16W
RSA3	0700041M	CF 1K OHM +-5% 1/16W
RSA4	0700041M	CF 1K OHM +-5% 1/16W
RSA5	0700041M	CF 1K OHM +-5% 1/16W
RSA6	0700041M	CF 1K OHM +-5% 1/16W
RSA7	0700041M	CF 1K OHM +-5% 1/16W
RSA8	0700041M	CF 1K OHM +-5% 1/16W
RSA9	0700054M	CF 10K OHM +-5% 1/16W
RSC1	0100047M	CF 180 OHM +-5% 1/8W
RSC2	0700041M	CF 1K OHM +-5% 1/16W
RSC3	0700041M	CF 1K OHM +-5% 1/16W
RSC4	0700041M	CF 1K OHM +-5% 1/16W
RSC5	0700041M	CF 1K OHM +-5% 1/16W
RSC6	0700041M	CF 1K OHM +-5% 1/16W
RSC7	0700041M	CF 1K OHM +-5% 1/16W
RSC8	0700027M	CF 100 OHM +-5% 1/16W
RSC9	0700027M	CF 100 OHM +-5% 1/16W
RSE1	0700054M	CF 10K OHM +-5% 1/16W
RSE2	0700054M	CF 10K OHM +-5% 1/16W
RSE3	0700041M	CF 1K OHM +-5% 1/16W
RSE4	0700041M	CF 1K OHM +-5% 1/16W
RSE5	0700041M	CF 1K OHM +-5% 1/16W
RSE6	0700041M	CF 1K OHM +-5% 1/16W
RSE7	0700041M	CF 1K OHM +-5% 1/16W
RSE8	0700041M	CF 1K OHM +-5% 1/16W
RSE9	0700041M	CF 1K OHM +-5% 1/16W
RSF2	0700041M	CF 1K OHM +-5% 1/16W
RSF3	0700041M	CF 1K OHM +-5% 1/16W
RSF6	0700041M	CF 1K OHM +-5% 1/16W
RSF7	0700041M	CF 1K OHM +-5% 1/16W
RSF8	0700041M	CF 1K OHM +-5% 1/16W
RSF9	0700041M	CF 1K OHM +-5% 1/16W
RSG1	0700041M	CF 1K OHM +-5% 1/16W
RSG2	0700054M	CF 10K OHM +-5% 1/16W
RSG3	0100047M	CF 180 OHM +-5% 1/8W
RSG4	0700041M	CF 1K OHM +-5% 1/16W
RSG5	0700041M	CF 1K OHM +-5% 1/16W
RSG6	0700041M	CF 1K OHM +-5% 1/16W
RSG7	0700054M	CF 10K OHM +-5% 1/16W
RSG9	0700045M	CF 2.2K OHM +-5% 1/16W
RSH1	0700045M	CF 2.2K OHM +-5% 1/16W
RSH2	0700058M	CF 22K OHM +-5% 1/16W
RSH3	0700067M	CF 100K OHM +-5% 1/16W
RSH4	0700058M	CF 22K OHM +-5% 1/16W
RSH5	0700045M	CF 2.2K OHM +-5% 1/16W
RSH6	0700045M	CF 2.2K OHM +-5% 1/16W
RSH7	0700045M	CF 2.2K OHM +-5% 1/16W
RSH8	0700045M	CF 2.2K OHM +-5% 1/16W
RSH9	0700054M	CF 10K OHM +-5% 1/16W

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SYMBOL NO.	PART NO.	PART DESCRIPTION	SYMBOL NO.	PART NO.	PART DESCRIPTION
RSJ1	0700054M	CF 10K OHM +-5% 1/16W	RS81	0700041M	CF 1K OHM +-5% 1/16W
RSJ2	0700056M	CF 15K OHM +-5% 1/16W	RS82	0700065	CF 68K OHM +-5% 1/16W
RSJ3	0700051M	CF 5.6K OHM +-5% 1/16W	RS83	0700063	CF 47K OHM +-5% 1/16W
RS01	0700041	CF 1K OHM +-5% 1/16W	RS84	0700063M	CF 47K OHM +-5% 1/16W
RS02	0700041	CF 1K OHM +-5% 1/16W	RS85	0700051	CF 5.6K OHM +-5% 1/16W
RS03	0700041	CF 1K OHM +-5% 1/16W	RS86	0700051M	CF 5.6K OHM +-5% 1/16W
RS04	0700041	CF 1K OHM +-5% 1/16W	RS87	0700051	CF 5.6K OHM +-5% 1/16W
RS05	0700041	CF 1K OHM +-5% 1/16W	RS88	0700035	CF 390 OHM +-5% 1/16W
RS06	0700062	CF 39K OHM +-5% 1/16W	RS89	0700043	CF 1.5K OHM +-5% 1/16W
RS07	0187096	CF 20K OHM +-5% 1/16W	RS90	0700051M	CF 5.6K OHM +-5% 1/16W
RS08	0700064	CF 56K OHM +-5% 1/16W	RS91	0700043M	CF 1.5K OHM +-5% 1/16W
RS09	0700051	CF 5.6K OHM +-5% 1/16W	RS97	0700041M	CF 1K OHM +-5% 1/16W
RS10	0700063	CF 47K OHM +-5% 1/16W	RS99	0700041M	CF 1K OHM +-5% 1/16W
RS11	0179536	MG 1M OHM +-5% 1/8W	RW01	0100121M	CF 220K OHM +-5% 1/8W
RS12	0700067	CF 100K OHM +-5% 1/16W	RW02	0100133M	CF 680K OHM +-5% 1/8W
RS13	0700067	CF 100K OHM +-5% 1/16W	RW13	0700041	CF 1K OHM +-5% 1/16W
RS14	0700045M	CF 2.2K OHM +-5% 1/16W	RW14	0700065	CF 68K OHM +-5% 1/16W
RS15	0700054M	CF 10K OHM +-5% 1/16W	RW15	0187076	CF 3K OHM +-5% 1/16W
RS16	0700037M	CF 560 OHM +-5% 1/16W	RW16	0187082	CF 5.1K OHM +-5% 1/16W
RS17	0700067M	CF 100K OHM +-5% 1/16W	RW17	0700056	CF 15K OHM +-5% 1/16W
RS18	0700054M	CF 10K OHM +-5% 1/16W	RW70	0187070M	CF 1.6K OHM +-5% 1/16W
RS19	0700045M	CF 2.2K OHM +-5% 1/16W	RW85	0700041	CF 1K OHM +-5% 1/16W
RS24	0700063	CF 47K OHM +-5% 1/16W	RW86	0700041	CF 1K OHM +-5% 1/16W
RS25	0700067	CF 100K OHM +-5% 1/16W	RX01	0700059	CF 27K OHM +-5% 1/16W
RS26	0700036	CF 470 OHM +-5% 1/16W	RX02	0700067	CF 100K OHM +-5% 1/16W
RS27	0700063	CF 47K OHM +-5% 1/16W	RX03	0700027	CF 100 OHM +-5% 1/16W
RS28	0700058	CF 22K OHM +-5% 1/16W	RX04	0700039	CF 820 OHM +-5% 1/16W
RS29	0700041	CF 1K OHM +-5% 1/16W	RX05	0700036	CF 470 OHM +-5% 1/16W
RS30	0700054M	CF 10K OHM +-5% 1/16W	RX06	0700043	CF 1.5K OHM +-5% 1/16W
RS31	0700052M	CF 6.8K OHM +-5% 1/16W	RX07	0700027	CF 100 OHM +-5% 1/16W
RS32	0700045M	CF 2.2K OHM +-5% 1/16W	RX08	0700039	CF 820 OHM +-5% 1/16W
RS33	0700045M	CF 2.2K OHM +-5% 1/16W	RX12	0700043	CF 1.5K OHM +-5% 1/16W
RS34	0700047M	CF 3.3K OHM +-5% 1/16W	RX13	0700039	CF 820 OHM +-5% 1/16W
RS35	0700047M	CF 3.3K OHM +-5% 1/16W	RX14	0700063	CF 47K OHM +-5% 1/16W
RS36	0700046M	CF 2.7K OHM +-5% 1/16W	RX15	0700036	CF 470 OHM +-5% 1/16W
RS37	0700037M	CF 560 OHM +-5% 1/16W	RX16	0700033	CF 270 OHM +-5% 1/16W
RS38	0700067M	CF 100K OHM +-5% 1/16W	RX17	0100125	CF 330K OHM +-5% 1/8W
RS39	0700063	CF 47K OHM +-5% 1/16W	RX18	0700056	CF 15K OHM +-5% 1/16W
RS40	0700067	CF 100K OHM +-5% 1/16W	RX19	0700041	CF 1K OHM +-5% 1/16W
RS41	0700063	CF 47K OHM +-5% 1/16W	RX20	0187054	CF 360 OHM +-5% 1/16W
RS42	0700054	CF 10K OHM +-5% 1/16W	RX21	0700051	CF 5.6K OHM +-5% 1/16W
RS43	0700054	CF 10K OHM +-5% 1/16W	RX22	0700041	CF 1K OHM +-5% 1/16W
RS44	0700054	CF 10K OHM +-5% 1/16W	RX23	0700035	CF 390 OHM +-5% 1/16W
RS45	1195051	FR 2.2 OHM +-5% 1/4W	RX24	0700054	CF 10K OHM +-5% 1/16W
RS46	1195051	FR 2.2 OHM +-5% 1/4W	RX25	0700054	CF 10K OHM +-5% 1/16W
RS47	1195051	FR 2.2 OHM +-5% 1/4W	RX26	0100130	CF 510K OHM +-5% 1/8W
RS48	0700063	CF 47K OHM +-5% 1/16W	RX27	0700047	CF 3.3K OHM +-5% 1/16W
RS49	0700065	CF 68K OHM +-5% 1/16W	RX28	0700039	CF 820 OHM +-5% 1/16W
RS50	0700065	CF 68K OHM +-5% 1/16W	RX29	0700027	CF 100 OHM +-5% 1/16W
RS51	0114161	CF 1K OHM +-5% 1/4W	RX30	0700039	CF 820 OHM +-5% 1/16W
RS52	0114161	CF 1K OHM +-5% 1/4W	RX31	0700041	CF 1K OHM +-5% 1/16W
RS53	0114161	CF 1K OHM +-5% 1/4W	RX32	0700039	CF 820 OHM +-5% 1/16W
RS54	0700054M	CF 10K OHM +-5% 1/16W	RX33	0700041	CF 1K OHM +-5% 1/16W
RS55	0700045M	CF 2.2K OHM +-5% 1/16W	RX34	0700057	CF 18K OHM +-5% 1/16W
RS56	0700045M	CF 2.2K OHM +-5% 1/16W	RX35	0700064	CF 56K OHM +-5% 1/16W
RS57	0700043M	CF 1.5K OHM +-5% 1/16W	RX36	0700036	CF 470 OHM +-5% 1/16W
RS58	0700041	CF 1K OHM +-5% 1/16W	RX37	0700041	CF 1K OHM +-5% 1/16W
RS59	0700041	CF 1K OHM +-5% 1/16W	RX38	0700033	CF 270 OHM +-5% 1/16W
RS60	0700041	CF 1K OHM +-5% 1/16W	RX39	0700054	CF 10K OHM +-5% 1/16W
RS61	0700067	CF 100K OHM +-5% 1/16W	RX40	0700027	CF 100 OHM +-5% 1/16W
RS62	0700067	CF 100K OHM +-5% 1/16W	RX41	0700039	CF 820 OHM +-5% 1/16W
RS63	0700067	CF 100K OHM +-5% 1/16W	RX42	0700041	CF 1K OHM +-5% 1/16W
RS64	0700067	CF 100K OHM +-5% 1/16W	RX43	0700043	CF 1.5K OHM +-5% 1/16W
RS65	0700067	CF 100K OHM +-5% 1/16W	RX44	0700041	CF 1K OHM +-5% 1/16W
RS66	0700067	CF 100K OHM +-5% 1/16W	RX45	0700062	CF 39K OHM +-5% 1/16W
RS67	0700058	CF 22K OHM +-5% 1/16W	RX46	0700054	CF 10K OHM +-5% 1/16W
RS68	0700058	CF 22K OHM +-5% 1/16W	RX47	0700036	CF 470 OHM +-5% 1/16W
RS69	0700058	CF 22K OHM +-5% 1/16W	RX48	0700034	CF 330 OHM +-5% 1/16W
RS70	0100065	CF 1K OHM +-5% 1/8W	RX49	0700027	CF 100 OHM +-5% 1/16W
RS77	0700051M	CF 5.6K OHM +-5% 1/16W	RX50	0700039	CF 820 OHM +-5% 1/16W
RS78	0700051M	CF 5.6K OHM +-5% 1/16W	RX51	0700047	CF 3.3K OHM +-5% 1/16W
RS79	0700063M	CF 47K OHM +-5% 1/16W	RX52	0700047	CF 3.3K OHM +-5% 1/16W
RS80	0700045M	CF 2.2K OHM +-5% 1/16W	RX53	0187088	CF 9.1K OHM +-5% 1/16W

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SYMBOL NO.	PART NO.	PART DESCRIPTION	SYMBOL NO.	PART NO.	PART DESCRIPTION
RX55	0700027	CF 100 OHM +-5% 1/16W	R022	0700058	CF 22K OHM +-5% 1/16W
RX57	0700054	CF 10K OHM +-5% 1/16W	R023	0700049	CF 4.7K OHM +-5% 1/16W
RX58	0100115	CF 120K OHM +-5% 1/8W	R024	0700051	CF 5.6K OHM +-5% 1/16W
RY01	0700027	CF 100 OHM +-5% 1/16W	R025	0700041	CF 1K OHM +-5% 1/16W
RY02	0700027	CF 100 OHM +-5% 1/16W	R026	0700041	CF 1K OHM +-5% 1/16W
RY03	0700027	CF 100 OHM +-5% 1/16W	R027	0700041	CF 1K OHM +-5% 1/16W
RY04	0700041	CF 1K OHM +-5% 1/16W	R028	0700041	CF 1K OHM +-5% 1/16W
RY05	0700027	CF 100 OHM +-5% 1/16W	R029	0700041	CF 1K OHM +-5% 1/16W
RY06	0700027	CF 100 OHM +-5% 1/16W	R030	0700041	CF 1K OHM +-5% 1/16W
RY07	0700027	CF 100 OHM +-5% 1/16W	R031	0700041	CF 1K OHM +-5% 1/16W
RY08	0700041	CF 1K OHM +-5% 1/16W	R033	0700054	CF 10K OHM +-5% 1/16W
RY09	0700041	CF 1K OHM +-5% 1/16W	R035	0700058	CF 22K OHM +-5% 1/16W
RY10	0700041	CF 1K OHM +-5% 1/16W	R036	0700065	CF 68K OHM +-5% 1/16W
RY11	0700041	CF 1K OHM +-5% 1/16W	R037	0700041	CF 1K OHM +-5% 1/16W
RY12	0700027	CF 100 OHM +-5% 1/16W	R038	0700041	CF 1K OHM +-5% 1/16W
RY13	0700027	CF 100 OHM +-5% 1/16W	R039	0700041	CF 1K OHM +-5% 1/16W
RY14	0700027	CF 100 OHM +-5% 1/16W	R040	0700027	CF 100 OHM +-5% 1/16W
RY15	0700027	CF 100 OHM +-5% 1/16W	R042	0700054	CF 10K OHM +-5% 1/16W
RY16	0700045	CF 2.2K OHM +-5% 1/16W	R043	0700054	CF 10K OHM +-5% 1/16W
RY17	0700047	CF 3.3K OHM +-5% 1/16W	R044	0700049	CF 4.7K OHM +-5% 1/16W
RY18	0700054	CF 10K OHM +-5% 1/16W	R047	0700057	CF 18K OHM +-5% 1/16W
RY19	0700041	CF 1K OHM +-5% 1/16W	R048	0700058	CF 22K OHM +-5% 1/16W
RY20	0700039	CF 820 OHM +-5% 1/16W	R049	0700058	CF 22K OHM +-5% 1/16W
RY21	0700048	CF 3.9K OHM +-5% 1/16W	R051	0700049	CF 4.7K OHM +-5% 1/16W
RY22	0700034	CF 330 OHM +-5% 1/16W	R052	0700054	CF 10K OHM +-5% 1/16W
RY23	0700025	CF 68 OHM +-5% 1/16W	R053	0700041	CF 1K OHM +-5% 1/16W
RY24	0700041	CF 1K OHM +-5% 1/16W	R055	0700054	CF 10K OHM +-5% 1/16W
RY25	0700054	CF 10K OHM +-5% 1/16W	R059	0700054	CF 10K OHM +-5% 1/16W
RY26	0700043	CF 1.5K OHM +-5% 1/16W	R060	0700054	CF 10K OHM +-5% 1/16W
RY27	0187080	CF 4.3K OHM +-5% 1/16W	R061	0700054	CF 10K OHM +-5% 1/16W
RY28	0700052	CF 6.8K OHM +-5% 1/16W	R062	0700054	CF 10K OHM +-5% 1/16W
RY29	0700047	CF 3.3K OHM +-5% 1/16W	R063	0700055	CF 12K OHM +-5% 1/16W
RY30	0700027	CF 100 OHM +-5% 1/16W	R064	0700054	CF 10K OHM +-5% 1/16W
RY31	0100038	CF 75 OHM +-5% 1/8W	R065	0700045	CF 2.2K OHM +-5% 1/16W
RY32	0100038	CF 75 OHM +-5% 1/8W	R066	0700058	CF 22K OHM +-5% 1/16W
RY33	0700063	CF 47K OHM +-5% 1/16W	R067	0700049	CF 4.7K OHM +-5% 1/16W
RY34	0700058	CF 22K OHM +-5% 1/16W	R068	0700067	CF 100K OHM +-5% 1/16W
RY35	0100038	CF 75 OHM +-5% 1/8W	R069	0700031	CF 180 OHM +-5% 1/16W
RY36	0100041	CF 100 OHM +-5% 1/8W	R070	0700066	CF 82K OHM +-5% 1/16W
RY37	0100041	CF 100 OHM +-5% 1/8W	R071	0700058	CF 22K OHM +-5% 1/16W
RY38	0700041	CF 1K OHM +-5% 1/16W	R073	0700041	CF 1K OHM +-5% 1/16W
RY39	0700034	CF 330 OHM +-5% 1/16W	R074	0700036	CF 470 OHM +-5% 1/16W
RY40	0114141	CF 270 OHM +-5% 1/4W	R075	0700036	CF 470 OHM +-5% 1/16W
RY41	0100037	CF 68 OHM +-5% 1/8W	R078	0700054	CF 10K OHM +-5% 1/16W
RY42	0100113	CF 100K OHM +-5% 1/8W	R079	0700054	CF 10K OHM +-5% 1/16W
RY43	0700041	CF 1K OHM +-5% 1/16W	R080	0100107	CF 56K OHM +-5% 1/8W
RY44	0700054	CF 10K OHM +-5% 1/16W	R081	0700051	CF 5.6K OHM +-5% 1/16W
RY45	0700039	CF 820 OHM +-5% 1/16W	R082	0700051	CF 5.6K OHM +-5% 1/16W
RY46	0700027	CF 100 OHM +-5% 1/16W	R083	0700036	CF 470 OHM +-5% 1/16W
RY47	0700054	CF 10K OHM +-5% 1/16W	R084	0700036	CF 470 OHM +-5% 1/16W
RY70	0187038	CF 75 OHM +-5% 1/16W	R085	0700041	CF 1K OHM +-5% 1/16W
RY71	0187038	CF 75 OHM +-5% 1/16W	R086	0700041	CF 1K OHM +-5% 1/16W
RY74	0700063	CF 47K OHM +-5% 1/16W	R087	0700027	CF 100 OHM +-5% 1/16W
RY75	0700041	CF 1K OHM +-5% 1/16W	R089	0700041	CF 1K OHM +-5% 1/16W
RY76	0700058	CF 22K OHM +-5% 1/16W	R091	0700049	CF 4.7K OHM +-5% 1/16W
R004	0100065	CF 1K OHM +-5% 1/8W	R092	0700041	CF 1K OHM +-5% 1/16W
R005	0100089	CF 10K OHM +-5% 1/8W	R093	0700041	CF 1K OHM +-5% 1/16W
R006	0100065	CF 1K OHM +-5% 1/8W	R094	0700041	CF 1K OHM +-5% 1/16W
R007	0100065	CF 1K OHM +-5% 1/8W	R095	0700056	CF 15K OHM +-5% 1/16W
R008	0700041	CF 1K OHM +-5% 1/16W	R096	0700054	CF 10K OHM +-5% 1/16W
R009	0700041	CF 1K OHM +-5% 1/16W	R097	0700063	CF 47K OHM +-5% 1/16W
R010	0700054	CF 10K OHM +-5% 1/16W	R099	0700063	CF 47K OHM +-5% 1/16W
R011	0700041	CF 1K OHM +-5% 1/16W	R100	0700067	CF 100K OHM +-5% 1/16W
R012	0700041	CF 1K OHM +-5% 1/16W	R101	0700058	CF 22K OHM +-5% 1/16W
R013	0700058	CF 22K OHM +-5% 1/16W	R102	0700058	CF 22K OHM +-5% 1/16W
R014	0700058	CF 22K OHM +-5% 1/16W	R103	0700041	CF 1K OHM +-5% 1/16W
R015	0700058	CF 22K OHM +-5% 1/16W	R104	0700041	CF 1K OHM +-5% 1/16W
R016	0700041	CF 1K OHM +-5% 1/16W	R105	0700041	CF 1K OHM +-5% 1/16W
R017	0700041	CF 1K OHM +-5% 1/16W	R106	0700058	CF 22K OHM +-5% 1/16W
R018	0700041	CF 1K OHM +-5% 1/16W	R107	0700041	CF 1K OHM +-5% 1/16W
R019	0700032	CF 220 OHM +-5% 1/16W	R108	0700051	CF 5.6K OHM +-5% 1/16W
R020	0700041	CF 1K OHM +-5% 1/16W	R109	0700041	CF 1K OHM +-5% 1/16W
R021	0700041	CF 1K OHM +-5% 1/16W	R110	0700041	CF 1K OHM +-5% 1/16W

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SYMBOL NO.	PART NO.	PART DESCRIPTION	SYMBOL NO.	PART NO.	PART DESCRIPTION
R112	0700063	CF 47K OHM +-5% 1/16W	R3B6	0700063	CF 47K OHM +-5% 1/16W
R113	0700056	CF 15K OHM +-5% 1/16W	R3B7	0700063	CF 47K OHM +-5% 1/16W
R116	0700054	CF 10K OHM +-5% 1/16W	R301	0700041	CF 1K OHM +-5% 1/16W
R117	0700054	CF 10K OHM +-5% 1/16W	R302	0700041	CF 1K OHM +-5% 1/16W
R118	0700054	CF 10K OHM +-5% 1/16W	R304	0700029	CF 150 OHM +-5% 1/16W
R119	0700041	CF 1K OHM +-5% 1/16W	R306	0700058	CF 22K OHM +-5% 1/16W
R130	0700058	CF 22K OHM +-5% 1/16W	R307	0700058	CF 22K OHM +-5% 1/16W
R131	0700055	CF 12K OHM +-5% 1/16W	R308	0700046	CF 2.7K OHM +-5% 1/16W
R132	0700063	CF 47K OHM +-5% 1/16W	R309	0700054	CF 10K OHM +-5% 1/16W
R133	0700054	CF 10K OHM +-5% 1/16W	R310	0700065	CF 68K OHM +-5% 1/16W
R134	0700058	CF 22K OHM +-5% 1/16W	R311	0700061	CF 33K OHM +-5% 1/16W
R135	0700041	CF 1K OHM +-5% 1/16W	R312	0700029	CF 150 OHM +-5% 1/16W
R136	0700041	CF 1K OHM +-5% 1/16W	R313	0700049	CF 4.7K OHM +-5% 1/16W
R137	0700041	CF 1K OHM +-5% 1/16W	R314	0700046	CF 2.7K OHM +-5% 1/16W
R138	0700041	CF 1K OHM +-5% 1/16W	R315	0700033	CF 270 OHM +-5% 1/16W
R139	0700041	CF 1K OHM +-5% 1/16W	R316	0700041	CF 1K OHM +-5% 1/16W
R140	0700041	CF 1K OHM +-5% 1/16W	R317	0700061	CF 33K OHM +-5% 1/16W
R141	0700041	CF 1K OHM +-5% 1/16W	R319	0700064	CF 56K OHM +-5% 1/16W
R142	0700041	CF 1K OHM +-5% 1/16W	R320	0700065	CF 68K OHM +-5% 1/16W
R143	0700041	CF 1K OHM +-5% 1/16W	R321	0700064	CF 56K OHM +-5% 1/16W
R144	0700041	CF 1K OHM +-5% 1/16W	R322	0700058	CF 22K OHM +-5% 1/16W
R145	0700027	CF 100 OHM +-5% 1/16W	R323	0700054	CF 10K OHM +-5% 1/16W
R146	0700054	CF 10K OHM +-5% 1/16W	R324	0700058	CF 22K OHM +-5% 1/16W
R147	0700041	CF 1K OHM +-5% 1/16W	R325	0150114	VR 10K OHM-B
R148	0700041	CF 1K OHM +-5% 1/16W	R326	0700062	CF 39K OHM +-5% 1/16W
R149	0700041	CF 1K OHM +-5% 1/16W	R327	0700059	CF 27K OHM +-5% 1/16W
R150	0700041	CF 1K OHM +-5% 1/16W	R328	0700046	CF 2.7K OHM +-5% 1/16W
R151	0100059	CF 560 OHM +-5% 1/8W	R329	0700047	CF 3.3K OHM +-5% 1/16W
R152	0700022	CF 39 OHM +-5% 1/16W	R330	0700029	CF 150 OHM +-5% 1/16W
R153	0100065	CF 1K OHM +-5% 1/8W	R331	0700049	CF 4.7K OHM +-5% 1/16W
R154	0700054	CF 10K OHM +-5% 1/16W	R332	0700049	CF 4.7K OHM +-5% 1/16W
R155	0700054	CF 10K OHM +-5% 1/16W	R333	0150115	VR 20K OHM-B
R156	0100065	CF 1K OHM +-5% 1/8W	R334	0700051	CF 5.6K OHM +-5% 1/16W
R157	0700034	CF 330 OHM +-5% 1/16W	R335	0700049	CF 4.7K OHM +-5% 1/16W
R158	0700041	CF 1K OHM +-5% 1/16W	R336	0100133	CF 680K OHM +-5% 1/8W
R159	0700051	CF 5.6K OHM +-5% 1/16W	R337	0700058	CF 22K OHM +-5% 1/16W
R161	0700041	CF 1K OHM +-5% 1/16W	R338	0700054	CF 10K OHM +-5% 1/16W
R166	0700054	CF 10K OHM +-5% 1/16W	R339	0700066	CF 82K OHM +-5% 1/16W
R167	0700054	CF 10K OHM +-5% 1/16W	R340	0700054	CF 10K OHM +-5% 1/16W
R168	0700054	CF 10K OHM +-5% 1/16W	R341	0700067	CF 100K OHM +-5% 1/16W
R169	0700037	CF 560 OHM +-5% 1/16W	R342	0700052	CF 6.8K OHM +-5% 1/16W
R170	0700027	CF 100 OHM +-5% 1/16W	R344	0700049	CF 4.7K OHM +-5% 1/16W
R171	0700029	CF 150 OHM +-5% 1/16W	R346	0700067	CF 100K OHM +-5% 1/16W
R172	0700029	CF 150 OHM +-5% 1/16W	R347	0700046	CF 2.7K OHM +-5% 1/16W
R173	0700041	CF 1K OHM +-5% 1/16W	R348	0700049	CF 4.7K OHM +-5% 1/16W
R174	0700041	CF 1K OHM +-5% 1/16W	R351	0700048	CF 3.9K OHM +-5% 1/16W
R175	0700058	CF 22K OHM +-5% 1/16W	R352	0700047	CF 3.3K OHM +-5% 1/16W
R176	0700058	CF 22K OHM +-5% 1/16W	R353	0700041	CF 1K OHM +-5% 1/16W
R177	0700027	CF 100 OHM +-5% 1/16W	R355	0700048	CF 3.9K OHM +-5% 1/16W
R178	0700063	CF 47K OHM +-5% 1/16W	R356	0700051	CF 5.6K OHM +-5% 1/16W
R180	0700027	CF 100 OHM +-5% 1/16W	R357	0700054	CF 10K OHM +-5% 1/16W
R181	0700027	CF 100 OHM +-5% 1/16W	R358	0179536	MG 1M OHM +-5% 1/8W
R182	0700041	CF 1K OHM +-5% 1/16W	R359	0700034	CF 330 OHM +-5% 1/16W
R183	0700041	CF 1K OHM +-5% 1/16W	R361	0700034	CF 330 OHM +-5% 1/16W
R184	0700041	CF 1K OHM +-5% 1/16W	R362	0700034	CF 330 OHM +-5% 1/16W
R185	0700054	CF 10K OHM +-5% 1/16W	R363	0700027	CF 100 OHM +-5% 1/16W
R186	0700041	CF 1K OHM +-5% 1/16W	R364	0700054	CF 10K OHM +-5% 1/16W
R188	0700054	CF 10K OHM +-5% 1/16W	R365	0700039	CF 820 OHM +-5% 1/16W
R189	0700063	CF 47K OHM +-5% 1/16W	R366	0700041	CF 1K OHM +-5% 1/16W
R190	0700051	CF 5.6K OHM +-5% 1/16W	R367	0150113	VR 5K OHM-B RS-6
R192	0100041	CF 100 OHM +-5% 1/8W	R368	0700051	CF 5.6K OHM +-5% 1/16W
R193	0700027	CF 100 OHM +-5% 1/16W	R369	0700033	CF 270 OHM +-5% 1/16W
R195	0700054	CF 10K OHM +-5% 1/16W	R371	0700041	CF 1K OHM +-5% 1/16W
R3A1	0700041	CF 1K OHM +-5% 1/16W	R374	0700047	CF 3.3K OHM +-5% 1/16W
R3A2	0700032	CF 220 OHM +-5% 1/16W	R375	0100125	CF 330K OHM +-5% 1/8W
R3A3	0700032	CF 220 OHM +-5% 1/16W	R376	0700041	CF 1K OHM +-5% 1/16W
R3A4	0700032	CF 220 OHM +-5% 1/16W	R381	0100051	CF 270 OHM +-5% 1/8W
R3A8	0100119	CF 180K OHM +-5% 1/8W	R382	0700062	CF 39K OHM +-5% 1/16W
R3A9	0700042	CF 1.2K OHM +-5% 1/16W	R383	0700038	CF 680 OHM +-5% 1/16W
R3B1	0700027	CF 100 OHM +-5% 1/16W	R384	0700039	CF 820 OHM +-5% 1/16W
R3B2	0700032	CF 220 OHM +-5% 1/16W	R385	0700043	CF 1.5K OHM +-5% 1/16W
R3B3	0700055	CF 12K OHM +-5% 1/16W	R386	0114135	CF 150 OHM +-5% 1/4W

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SYMBOL NO.	PART NO.	PART DESCRIPTION	SYMBOL NO.	PART NO.	PART DESCRIPTION
R388	0700027	CF 100 OHM +-5% 1/16W	R547	0114131	CF 100 OHM +-5% 1/4W
R389	0700063	CF 47K OHM +-5% 1/16W	R548	0700054	CF 10K OHM +-5% 1/16W
R390	0100055	CF 390 OHM +-5% 1/8W	R549	0700029	CF 150 OHM +-5% 1/16W
R391	0100115	CF 120K OHM +-5% 1/8W	R550	0700066	CF 82K OHM +-5% 1/16W
R392	0700041	CF 1K OHM +-5% 1/16W	R607	0179536	MG 1M OHM +-5% 1/8W
R393	0700052	CF 6.8K OHM +-5% 1/16W	R608	0700063	CF 47K OHM +-5% 1/16W
R394	0700046	CF 2.7K OHM +-5% 1/16W	R609	0100065	CF 1K OHM +-5% 1/8W
R395	0700043	CF 1.5K OHM +-5% 1/16W	R610	0700061	CF 33K OHM +-5% 1/16W
R396	0700061	CF 33K OHM +-5% 1/16W	R611	0700064	CF 56K OHM +-5% 1/16W
R397	0700057	CF 18K OHM +-5% 1/16W	R612	0150307	VR 30K OHM
R398	0100121	CF 220K OHM +-5% 1/8W	R613	0700065	CF 68K OHM +-5% 1/16W
R399	0700041	CF 1K OHM +-5% 1/16W	R614	0700061	CF 33K OHM +-5% 1/16W
R400	0700029	CF 150 OHM +-5% 1/16W	R615	0700038	CF 680 OHM +-5% 1/16W
R401	0700039	CF 820 OHM +-5% 1/16W	R616	0700064	CF 56K OHM +-5% 1/16W
R402	0700034	CF 330 OHM +-5% 1/16W	R617	0119722	MF 1 OHM +-5% 1W
R466	0700041	CF 1K OHM +-5% 1/16W	R618	0119722	MF 1 OHM +-5% 1W
R467	0700041	CF 1K OHM +-5% 1/16W	R619	0700027	CF 100 OHM +-5% 1/16W
R471	0700054	CF 10K OHM +-5% 1/16W	R620	0700054	CF 10K OHM +-5% 1/16W
R472	0700054	CF 10K OHM +-5% 1/16W	R621	0700051	CF 5.6K OHM +-5% 1/16W
R473	0700045M	CF 2.2K OHM +-5% 1/16W	R622	0700065	CF 68K OHM +-5% 1/16W
R474	0700045M	CF 2.2K OHM +-5% 1/16W	R623	0113766	CF 4.7K OHM +-5% 1/2W
R475	0700046M	CF 2.7K OHM +-5% 1/16W	R624	0110121	MF 100 OHM +-5% 1W
R476	0700046M	CF 2.7K OHM +-5% 1/16W	R625	0113725	CF 100 OHM +-5% 1/2W
R477	0700063	CF 47K OHM +-5% 1/16W	R626	0113725	CF 100 OHM +-5% 1/2W
R478	0700067	CF 100K OHM +-5% 1/16W	R627	0113725	CF 100 OHM +-5% 1/2W
R479	0700036	CF 470 OHM +-5% 1/16W	R635	0100053	CF 330 OHM +-5% 1/8W
R480	1195051	FR 2.2 OHM +-5% 1/4W	R636	0100063	CF 820 OHM +-5% 1/8W
R481	1195051	FR 2.2 OHM +-5% 1/4W	R637	0700044	CF 1.8K OHM +-5% 1/16W
R482	0700063	CF 47K OHM +-5% 1/16W	R638	0700058	CF 22K OHM +-5% 1/16W
R483	0700041	CF 1K OHM +-5% 1/16W	R639	0700041	CF 1K OHM +-5% 1/16W
R484	0700058	CF 22K OHM +-5% 1/16W	R640	0700041	CF 1K OHM +-5% 1/16W
R485	0700065	CF 68K OHM +-5% 1/16W	R641	0700052	CF 6.8K OHM +-5% 1/16W
R486	0700065	CF 68K OHM +-5% 1/16W	R642	0700061	CF 33K OHM +-5% 1/16W
R487	0114161	CF 1K OHM +-5% 1/4W	R643	0700056	CF 15K OHM +-5% 1/16W
R488	0114161	CF 1K OHM +-5% 1/4W	R646	0700045	CF 2.2K OHM +-5% 1/16W
R501	0187086	CF 7.5K OHM +-5% 1/16W	R647	0700054	CF 10K OHM +-5% 1/16W
R502	0150110	VR 500 OHM-B	R648	0700055	CF 12K OHM +-5% 1/16W
R503	0700036	CF 470 OHM +-5% 1/16W	R649	0150114	VR 10K OHM-B
R505	0150110	VR 500 OHM-B	R650	0700051	CF 5.6K OHM +-5% 1/16W
R506	0150111	VR 1K OHM-B	R651	0700058	CF 22K OHM +-5% 1/16W
R507	0700067	CF 100K OHM +-5% 1/16W	R652	0700063	CF 47K OHM +-5% 1/16W
R508	0700036	CF 470 OHM +-5% 1/16W	R653	0700041	CF 1K OHM +-5% 1/16W
R509	0700041	CF 1K OHM +-5% 1/16W	R654	0700047	CF 3.3K OHM +-5% 1/16W
R510	0179536	MG 1M OHM +-5% 1/8W	R655	0700067	CF 100K OHM +-5% 1/16W
R513	0700041	CF 1K OHM +-5% 1/16W	R656	0700045	CF 2.2K OHM +-5% 1/16W
R514	0100129	CF 470K OHM +-5% 1/8W	R658	0114135	CF 150 OHM +-5% 1/4W
R516	0700066	CF 82K OHM +-5% 1/16W	R659	0100045	CF 150 OHM +-5% 1/8W
R517	0700054	CF 10K OHM +-5% 1/16W	R660	0119731	FR 0.68 OHM 1W
R518	0700067	CF 100K OHM +-5% 1/16W	R661	0700054	CF 10K OHM +-5% 1/16W
R519	0700061	CF 33K OHM +-5% 1/16W	R662	0700041	CF 1K OHM +-5% 1/16W
R520	0700067	CF 100K OHM +-5% 1/16W	R663	0700059	CF 27K OHM +-5% 1/16W
R521	0700054	CF 10K OHM +-5% 1/16W	R664	0700041	CF 1K OHM +-5% 1/16W
R522	0700065	CF 68K OHM +-5% 1/16W	R665	0700054	CF 10K OHM +-5% 1/16W
R523	0700054	CF 10K OHM +-5% 1/16W	R666	0700059	CF 27K OHM +-5% 1/16W
R526	0700054	CF 10K OHM +-5% 1/16W	R667	0119732	MF 1.2 OHM +-10% 1W
R527	0700054	CF 10K OHM +-5% 1/16W	R680	0700039	CF 820 OHM +-5% 1/16W
R528	0700067	CF 100K OHM +-5% 1/16W	R701	0700039	CF 820 OHM +-5% 1/16W
R529	0700059	CF 27K OHM +-5% 1/16W	R702	0700041	CF 1K OHM +-5% 1/16W
R530	0700047	CF 3.3K OHM +-5% 1/16W	R703	0113770	CF 6.8K OHM +-5% 1/2W
R531	0700049	CF 4.7K OHM +-5% 1/16W	R704	0110355	MF 2.7K OHM +-5% 3W
R532	0700061	CF 33K OHM +-5% 1/16W	R705	0110351	MF 1.8K OHM +-5% 3W
R533	0700046	CF 2.7K OHM +-5% 1/16W	⚠ R706	0119688	MF 0.22 OHM +-5% 1W
R534	0700054	CF 10K OHM +-5% 1/16W	R707	0100031	CF 39 OHM +-5% 1/8W
R535	0700054	CF 10K OHM +-5% 1/16W	R708	0113791	CF 47K OHM +-5% 1/2W
R538	0100037	CF 68 OHM +-5% 1/8W	R709	0113785	CF 27K OHM +-5% 1/2W
R539	0100049	CF 220 OHM +-5% 1/8W	R710	0110229	MF 220 OHM +-5% 2W
R540	0100049	CF 220 OHM +-5% 1/8W	⚠ R711	1195121	FR 1 OHM +-5% 1/4W
R541	0100049	CF 220 OHM +-5% 1/8W	⚠ R712	0119514	FR 10 OHM +-5% 1/4W
R542	0700041	CF 1K OHM +-5% 1/16W	R713	0113717	CF 47 OHM +-5% 1/2W
R543	0700027	CF 100 OHM +-5% 1/16W	⚠ R714	0700063	CF 47K OHM +-5% 1/16W
R544	0700054	CF 10K OHM +-5% 1/16W	R715	0100085	CF 6.8K OHM +-5% 1/8W
R545	0700054	CF 10K OHM +-5% 1/16W	R716	0700042	CF 1.2K OHM +-5% 1/16W
R546	0700056	CF 15K OHM +-5% 1/16W	R717	0114149	CF 560 OHM +-5% 1/4W

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SYMBOL NO.	PART NO.	PART DESCRIPTION	SYMBOL NO.	PART NO.	PART DESCRIPTION
R718	0100127	CF 390K OHM +-5% 1/8W	⚠ R934	0119839	MF 0.56 OHM +-5% 1W
R719	0700054	CF 10K OHM +-5% 1/16W	R935	0700054	CF 10K OHM +-5% 1/16W
R721	0110365	MF 6.8K OHM +-5% 3W	R936	0700058	CF 22K OHM +-5% 1/16W
R723	0110215	MF 56 OHM +-5% 2W	R937	0700063	CF 47K OHRKA5 700044 CF 1.8K OHM +-5% 1/16W
R724	0114177	CF 4.7K OHM +-5% 1/4W	⚠ R938	0113797	CF 82K OHM +-5% 1/2W
R725	0700052	CF 6.8K OHM +-5% 1/16W	⚠ R939	0700051	CF 5.6K OHM +-5% 1/16W
R726	0700048	CF 3.9K OHM +-5% 1/16W	R940	0700054	CF 10K OHM +-5% 1/16W
R727	0700049	CF 4.7K OHM +-5% 1/16W	R941	0700054	CF 10K OHM +-5% 1/16W
R728	0700045	CF 2.2K OHM +-5% 1/16W	R942	0700058	CF 22K OHM +-5% 1/16W
R729	0700047	CF 3.3K OHM +-5% 1/16W	R943	0700036	CF 470 OHM +-5% 1/16W
R730	0113729	CF 150 OHM +-5% 1/2W	R944	0700041	CF 1K OHM +-5% 1/16W
R731	0110101	MF 15 OHM +-5% 1W	⚠ R945	0700039	CF 820 OHM +-5% 1/16W
R734	0110145	MF 1K OHM +-5% 1W	⚠ R946	0700043	CF 1.5K OHM +-5% 1/16W
R735	0110129	MF 220 OHM +-5% 1W	R947	0700041	CF 1K OHM +-5% 1/16W
⚠ R741	0700046	CF 2.7K OHM +-5% 1/16W	R948	0700045	CF 2.2K OHM +-5% 1/16W
R742	0100087	CF 8.2K OHM +-5% 1/8W	R949	0700038	CF 680 OHM +-5% 1/16W
R743	0700051	CF 5.6K OHM +-5% 1/16W	R950	0700039	CF 820 OHM +-5% 1/16W
R744	0700052	CF 6.8K OHM +-5% 1/16W	R951	0700049	CF 4.7K OHM +-5% 1/16W
R745	0700056	CF 15K OHM +-5% 1/16W	R952	0700043	CF 1.5K OHM +-5% 1/16W
R746	0114139	CF 220 OHM +-5% 1/4W	R953	0700051	CF 5.6K OHM +-5% 1/16W
R801	0140326S	MF 5.6K OHM +-5% 5W	R954	0700051	CF 5.6K OHM +-5% 1/16W
R803	0113744	CF 560 OHM +-5% 1/2W	R956	0700045	CF 2.2K OHM +-5% 1/16W
R806	0113815	CF 470K OHM +-5% 1/2W	R958	0700067	CF 100K OHM +-5% 1/16W
R809	0100065	CF 1K OHM +-5% 1/8W	R959	0700051	CF 5.6K OHM +-5% 1/16W
R810	0100035	CF 56 OHM +-5% 1/8W	R972	0110145	MF 1K OHM +-5% 1W
R811	0100065	CF 1K OHM +-5% 1/8W	R973	0700042	CF 1.2K OHM +-5% 1/16W
R812	0100044	CF 130 OHM +-5% 1/8W	R978	0700052	CF 6.8K OHM +-5% 1/16W
R815	0100059	CF 560 OHM +-5% 1/8W	R980	0700045	CF 2.2K OHM +-5% 1/16W
R817	0100041	CF 100 OHM +-5% 1/8W			
R818	0100049	CF 220 OHM +-5% 1/8W			**IC'S**
R831	0140326S	MF 5.6K OHM +-5% 5W			
R833	0113744	CF 560 OHM +-5% 1/2W	IA02	2366301	IC UPD4052BC
R836	0113815	CF 470K OHM +-5% 1/2W	IK02	2003421	IC UPC7805AHF
R840	0100035	CF 56 OHM +-5% 1/8W	IK04	2003191	IC STK4274 (LINEAR)
R841	0100065	CF 1K OHM +-5% 1/8W	IK05	2003191	IC STK4274 (LINEAR)
R842	0100033	CF 47 OHM +-5% 1/8W	IK06	2003191	IC STK4274 (LINEAR)
⚠ R843	0150001	VR 200 OHM-B	IK08	CP01631R	IC PST9142-T (HHEA MD)
R845	0100059	CF 560 OHM +-5% 1/8W	IS01	CP00801U	IC LA2785 (HHEA MD)
R847	0100041	CF 100 OHM +-5% 1/8W	IS02	CP00791U	IC LV1010N (HHEA MD)
R850	0100089	CF 10K OHM +-5% 1/8W	IS03	2362602	IC HA17458/UPC4558
R851	0100051	CF 270 OHM +-5% 1/8W	IS04	2362602	IC HA17458/UPC4558
R861	0140326S	MF 5.6K OHM +-5% 5W	IS05	2004681	IC TA8218AH
R863	0113744	CF 560 OHM +-5% 1/2W	IS06	2362602	IC UPC4558
R866	0113815	CF 470K OHM +-5% 1/2W	IS07	2362602	IC HA17458/UPC4558
R870	0100035	CF 56 OHM +-5% 1/8W	IS08	2362602	IC UPC4558
R871	0100065	CF 1K OHM +-5% 1/8W	IS09	2004362	IC CXA1279AS
R872	0100033	CF 47 OHM +-5% 1/8W	IS10	CP008710	IC M62393P
⚠ R873	0150001	VR 200 OHM-B	IS11	2000361	IC M51132L
R875	0100059	CF 560 OHM +-5% 1/8W	IS12	2362651	IC HD14053B
R877	0100049	CF 220 OHM +-5% 1/8W	IS13	2000361	IC M51132L
R880	0100089	CF 10K OHM +-5% 1/8W	IS14	2000361	IC M51132L
R881	0100043	CF 120 OHM +-5% 1/8W	IS15	2004362	IC CXA1279AS
R903	0147060	WW 33 OHM +-5% 2W	IS16	CP00871U	IC M62393P
⚠ R904	0147804	WW 0.75 OHM 15W	IW01	CP00811	IC UPC1852BCT (HHEA MD)
R905	0148009	WW 0.056 OHM 2W	IX01	CP01081U	IC TC9089AN
R906	0700037	CF 560 OHM +-5% 1/16W	IX02	CP00121U	IC MM1093N
R907	0700046	CF 2.7K OHM +-5% 1/16W	IY01	2020452	IC CXA1545AS
R908	0700054	CF 10K OHM +-5% 1/16W	I001	CP01195	IC CPU-MN1874862HHR
R909	0700047	CF 3.3K OHM +-5% 1/16W	I002	2366301	IC UPD4052BC
R911	0700049	CF 4.7K OHM +-5% 1/16W	I003	CP00822	IC M6M80042P (HHEA MD)
R912	0700049	CF 4.7K OHM +-5% 1/16W	I004	2000541	IC M51951BSL
R913	0110169	MF 10K OHM +-5% 1W	I005	2381141	HD74HC32P
R914	0700023	CF 47 OHM +-5% 1/16W	I402	2004751	IC TA8200AH
R915	0700027	CF 100 OHM +-5% 1/16W	I501	2020324	IC YAT016H
R916	0700036	CF 470 OHM +-5% 1/16W	I502	2003421	IC UPC7805AHF
R917	0700061	CF 33K OHM +-5% 1/16W	I503	2004665	IC PQ09RF21
R918	0114161	CF 1K OHM +-5% 1/4W	I504	2003421	IC UPC7805AHF
R920	0110237	MF 470 OHM +-5% 2W	I601	2003541	IC LA7838 (LINEAR)
R921	0700057	CF 18K OHM +-5% 1/16W	⚠ I901	2373343	MODULE STR-M6511
R922	0700057	CF 18K OHM +-5% 1/16W	⚠ I902	2000465	IC PS2501-1 (KD/LD) (PHOTO COUPLER)
R923	0700047	CF 3.3K OHM +-5% 1/16W	⚠ I903	2000465	IC PS2501-1 (KD/LD) (PHOTO COUPLER)
R924	0700047	CF 3.3K OHM +-5% 1/16W	⚠ I904	2381343	IC SE115N
R932	0110145	MF 1K OHM +-5% 1W	I906	2003413	IC UPC7912HF

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SYMBOL NO.	PART NO.	PART DESCRIPTION	SYMBOL NO.	PART NO.	PART DESCRIPTION
I907	2003424	IC UPC7812AHF (LINEAR)	QS07	2320591	TR 2SC458B/C SI 230MHZ 200MW
			QS08	2320591	TR 2SC458B/C SI 230MHZ 200MW
		TRANSISTORS	QS11	2327772M	TR 2SC3413B/C SI 200MHZ
			QS12	2327772M	TR 2SC3413B/C SI 200MHZ
QA01	2320591	TR 2SC458B/C SI 230MHZ 200MW	QS13	2327772M	TR 2SC3413B/C SI 200MHZ
QA02	2320637	TR 2SA673C/D SI 80MHZ 400MW	QS14	2327772M	TR 2SC3413B/C SI 200MHZ
QA03	2320591	TR 2SC458B/C SI 230MHZ 200MW	QS15	2327772M	TR 2SC3413B/C SI 200MHZ
QA04	2320637	TR 2SA673C/D SI 80MHZ 400MW	QS17	2320591M	TR 2SC458B/C SI 230MHZ 200MW
QA05	2320591	TR 2SC458B/C SI 230MHZ 200MW	QX01	2320591	TR 2SC458B/C SI 230MHZ 200MW
QA06	2320591	TR 2SC458B/C SI 230MHZ 200MW	QX02	2320591	TR 2SC458B/C SI 230MHZ 200MW
QA07	2320591	TR 2SC458B/C SI 230MHZ 200MW	QX04	2320591	TR 2SC458B/C SI 230MHZ 200MW
QA08	2320637	TR 2SA673C/D SI 80MHZ 400MW	QX05	2320591	TR 2SC458B/C SI 230MHZ 200MW
QA09	2320591	TR 2SC458B/C SI 230MHZ 200MW	QX06	2320591	TR 2SC458B/C SI 230MHZ 200MW
QA10	2320637	TR 2SA673C/D SI 80MHZ 400MW	QX07	2320637	TR 2SA673C/D SI 80MHZ 400MW
QA11	2320591	TR 2SC458B/C SI 230MHZ 200MW	QX08	2320591	TR 2SC458B/C SI 230MHZ 200MW
QA12	2320591	TR 2SC458B/C SI 230MHZ 200MW	QX09	2320591	TR 2SC458B/C SI 230MHZ 200MW
QA70	2320591	TR 2SC458B/C SI 230MHZ 200MW	QX10	2320591	TR 2SC458B/C SI 230MHZ 200MW
QA71	2320591	TR 2SC458B/C SI 230MHZ 200MW	QX11	2320637	TR 2SA673C/D SI 80MHZ 400MW
QA72	2326871	TR DTC124ES	QX12	2320591	TR 2SC458B/C SI 230MHZ 200MW
QA73	2326871	TR DTC124ES	QY01	2320591	TR 2SC458B/C SI 230MHZ 200MW
QC01	2320591	TR 2SC458B/C SI 230MHZ 200MW	QY02	2320591	TR 2SC458B/C SI 230MHZ 200MW
QC02	2320591	TR 2SC458B/C SI 230MHZ 200MW	QY03	2321351	TR 2SA836/844 D/E SI 200MHZ 300MW
QC03	2320591	TR 2SC458B/C SI 230MHZ 200MW	QY04	2320591	TR 2SC458B/C SI 230MHZ 200MW
QC04	2326871	TR DTC124ES	QY05	2326871	TR DTC124ES
QC05	2320591	TR 2SC458B/C SI 230MHZ 200MW	QY06	2320591	TR 2SC458B/C SI 230MHZ 200MW
QE01	2320598	TR 2SC458B/C/D SI 230MHZ 200MW	QY07	2326021	TR 2SC1741S
QE02	2320598	TR 2SC458B/C/D SI 230MHZ 200MW	QY08	2320591	TR 2SC458B/C SI 230MHZ 200MW
QE03	2320598	TR 2SC458B/C/D SI 230MHZ 200MW	Q001	2320591	TR 2SC458B/C SI 230MHZ 200MW
QE04	2320598	TR 2SC458B/C/D SI 230MHZ 200MW	Q002	2320591	TR 2SC458B/C SI 230MHZ 200MW
QE05	2320598	TR 2SC458B/C/D SI 230MHZ 200MW	Q003	2320591	TR 2SC458B/C SI 230MHZ 200MW
QE06	2320643	TR 2SC1213C SI 80MHZ 400MW	Q004	2320643	TR 2SC1213C SI 80MHZ 400MW
QE07	2321351	TR 2SA836/844 D/E SI 200MHZ 300MW	Q005	2320643	TR 2SC1213C SI 80MHZ 400MW
QE08	2315381	TRANSISTOR 2SA1837	Q006	2320591	TR 2SC458B/C SI 230MHZ 200MW
QE09	2315391	TRANSISTOR 2SC4793	Q007	2320637	TR 2SA673C/D SI 80MHZ 400MW
QE10	2320598	TR 2SC458B/C/D SI 230MHZ 200MW	Q009	2320591	TR 2SC458B/C SI 230MHZ 200MW
⚠ QF01	2314991	TRANSISTOR 2SC4630	Q010	2320591	TR 2SC458B/C SI 230MHZ 200MW
QF02	2320663	TR 2SC1213AC SI 80MHZ 400MW	Q011	2320591	TR 2SC458B/C SI 230MHZ 200MW
QF03	2320663	TR 2SC1213AC SI 80MHZ 400MW	Q014	2320591	TR 2SC458B/C SI 230MHZ 200MW
QF04	2320663	TR 2SC1213AC SI 80MHZ 400MW	Q015	2320591	TR 2SC458B/C SI 230MHZ 200MW
QF05	2320663	TR 2SC1213AC SI 80MHZ 400MW	Q016	2320637	TR 2SA673C/D SI 80MHZ 400MW
QF06	2320663	TR 2SC1213AC SI 80MHZ 400MW	Q017	2320591	TR 2SC458B/C SI 230MHZ 200MW
QF07	2320663	TR 2SC1213AC SI 80MHZ 400MW	Q018	2320598	TR 2SC458B/C/D SI 230MHZ 200MW
QF08	2320591	TR 2SC458B/C SI 230MHZ 200MW	Q019	2323521	TR 2SD789 B/C/D/E
QF09	2320591	TR 2SC458B/C SI 230MHZ 200MW	Q020	2320643	TR 2SC1213C SI 80MHZ 400MW
QF10	2320591	TR 2SC458B/C SI 230MHZ 200MW	Q021	2320591	TR 2SC458B/C SI 230MHZ 200MW
QF11	2320591	TR 2SC458B/C SI 230MHZ 200MW	Q022	2320591	TR 2SC458B/C SI 230MHZ 200MW
QK01	2320591	TR 2SC458B/C SI 230MHZ 200MW	Q023	2320591	TR 2SC458B/C SI 230MHZ 200MW
QK02	2320591	TR 2SC458B/C SI 230MHZ 200MW	Q024	2320591	TR 2SC458B/C SI 230MHZ 200MW
QK03	2320591	TR 2SC458B/C SI 230MHZ 200MW	Q302	2320591	TR 2SC458B/C SI 230MHZ 200MW
QK04	2320591	TR 2SC458B/C SI 230MHZ 200MW	Q303	2320591	TR 2SC458B/C SI 230MHZ 200MW
QK08	2320637	TR 2SA673C/D SI 80MHZ 400MW	Q304	2320591	TR 2SC458B/C SI 230MHZ 200MW
QK09	2320637	TR 2SA673C/D SI 80MHZ 400MW	Q305	2320591	TR 2SC458B/C SI 230MHZ 200MW
QK10	2312172	TRANSISTOR 2SD2375 Q/P (HHEA MD)	Q306	2320591	TR 2SC458B/C SI 230MHZ 200MW
QL10	2320637	TR 2SA673C/D SI 80MHZ 400MW	Q307	2326871	TR DTC124ES
QL11	2320637	TR 2SA673C/D SI 80MHZ 400MW	Q308	2326871	TR DTC124ES
QL12	2320637	TR 2SA673C/D SI 80MHZ 400MW	Q309	2320591	TR 2SC458B/C SI 230MHZ 200MW
QL13	2320637	TR 2SA673C/D SI 80MHZ 400MW	Q312	2320637	TR 2SA673C/D SI 80MHZ 400MW
QL14	2320637	TR 2SA673C/D SI 80MHZ 400MW	Q313	2326021	TR 2SC1741S
QL15	2320637	TR 2SA673C/D SI 80MHZ 400MW	Q314	2320591	TR 2SC458B/C SI 230MHZ 200MW
QL16	2320637	TR 2SA673C/D SI 80MHZ 400MW	Q315	2320637	TR 2SA673C/D SI 80MHZ 400MW
QL17	2320637	TR 2SA673C/D SI 80MHZ 400MW	Q316	2320591	TR 2SC458B/C SI 230MHZ 200MW
QM01	2320591	TR 2SC458B/C SI 230MHZ 200MW	Q317	2320591	TR 2SC458B/C SI 230MHZ 200MW
QM02	2312992	PHOTO TRANSISTOR PRT-38PT3F(M)	Q318	2320591	TR 2SC458B/C SI 230MHZ 200MW
QN01	2320591	TR 2SC458B/C SI 230MHZ 200MW	Q319	2320591	TR 2SC458B/C SI 230MHZ 200MW
QN02	2320591	TR 2SC458B/C SI 230MHZ 200MW	Q419	2320591	TR 2SC458B/C SI 230MHZ 200MW
QN03	2320637	TR 2SA673C/D SI 80MHZ 400MW	Q420	2320591	TR 2SC458B/C SI 230MHZ 200MW
QN04	2320591	TR 2SC458B/C SI 230MHZ 200MW	Q421	2320591	TR 2SC458B/C SI 230MHZ 200MW
QN05	2320591	TR 2SC458B/C SI 230MHZ 200MW	Q422	2320591	TR 2SC458B/C SI 230MHZ 200MW
QN06	2320637	TR 2SA673C/D SI 80MHZ 400MW	Q504	2320591	TR 2SC458B/C SI 230MHZ 200MW
QS03	2320591	TR 2SC458B/C SI 230MHZ 200MW	Q505	2320637	TR 2SA673C/D SI 80MHZ 400MW
QS04	2320591	TR 2SC458B/C SI 230MHZ 200MW	Q506	2320591	TR 2SC458B/C SI 230MHZ 200MW
QS05	2320591	TR 2SC458B/C SI 230MHZ 200MW	Q601	2320591	TR 2SC458B/C SI 230MHZ 200MW
QS06	2320591	TR 2SC458B/C SI 230MHZ 200MW	Q604	2320637	TR 2SA673C/D SI 80MHZ 400MW

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SYMBOL NO.	PART NO.	PART DESCRIPTION	SYMBOL NO.	PART NO.	PART DESCRIPTION
Q605	2320637	TR 2SA673C/D SI 80MHZ 400MW	DK12	2334324	ZD RD36EB3
Q606	2312177	TRANSISTOR 2SD 2375 LD P (HHEA MD)	DK13	2334324	ZD RD36EB3
Q607	2320637	TR 2SA673C/D SI 80MHZ 400MW	DK14	2334324	ZD RD36EB3
Q608	2320591	TR 2SC458B/C SI 230MHZ 200MW	DK15	2334324	ZD RD36EB3
Q609	2320637	TR 2SA673C/D SI 80MHZ 400MW	DK16	2334324	ZD RD36EB3
Q610	2320637	TR 2SA673C/D SI 80MHZ 400MW	DK17	2334324	ZD RD36EB3
Q612	2320591	TR 2SC458B/C SI 230MHZ 200MW	DK19	2398611	DI 1SS254
Q701	2326216	TR 2SC3116 S/T	DK23	2331154	ZD HZ12 (A1-3/B1-3/C1-3)
Q704	2320591	TR 2SC458B/C SI 230MHZ 200MW	DK24	2331154	ZD HZ12 (A1-3/B1-3/C1-3)
Q705	2320637	TR 2SA673C/D SI 80MHZ 400MW	DK25	2331154	ZD HZ12 (A1-3/B1-3/C1-3)
Q706	2320591	TR 2SC458B/C SI 230MHZ 200MW	DK26	2331154	ZD HZ12 (A1-3/B1-3/C1-3)
Q707	2320637	TR 2SA673C/D SI 80MHZ 400MW	DK27	2331154	ZD HZ12 (A1-3/B1-3/C1-3)
⚠ Q777	2315274F	TRANSISTOR 2SC4589-05	DK28	2331154	ZD HZ12 (A1-3/B1-3/C1-3)
Q801	2312372F	TRANSISTOR 2SC3942	DK32	2398611	DI 1SS254
Q802	2320663	TR 2SC1213AC SI 80MHZ 400MW	DK39	2339551	DI EK14
Q803	2320637	TR 2SA673C/D SI 80MHZ 400MW	DK40	2331154	ZD HZ12 (A1-3/B1-3/C1-3)
Q804	2320591	TR 2SC458B/C SI 230MHZ 200MW	DM01	2398611	DI 1SS254
Q831	2312372F	TRANSISTOR 2SC3942	DM02	2398611	DI 1SS254
Q832	2320663	TR 2SC1213AC SI 80MHZ 400MW	DM03	2339691	LED SLH-56VC77F
Q833	2320637	TR 2SA673C/D SI 80MHZ 400MW	DM04	2339889	ZD HZS12C3
Q835	2320591	TR 2SC458B/C SI 230MHZ 200MW	DN01	2398611	DI 1SS254
Q861	2312372F	TRANSISTOR 2SC3942	DN02	2398611	DI 1SS254
Q862	2320663	TR 2SC1213AC SI 80MHZ 400MW	DN03	2398611	DI 1SS254
Q863	2320637	TR 2SA673C/D SI 80MHZ 400MW	DN04	2398611	DI 1SS254
Q865	2320591	TR 2SC458B/C SI 230MHZ 200MW	DN05	2398611	DI 1SS254
Q901	2320665	TR 2SC1213A(D)	DN06	2339825	ZD HZS4B2
Q902	2312171	TR 2SC3852	DN07	2398611	DI 1SS254
⚠ Q903	2323782	TR 03P2M	DN08	CH00151M	DIODE DSM1SD2
⚠ Q909	2321112	TR 2SA778A	DN09	2331849	ZD HZ-12(C3)
Q912	2320591	TR 2SC458B/C SI 230MHZ 200MW	DN10	2398611	DI 1SS254
Q913	2320591	TR 2SC458B/C SI 230MHZ 200MW	DS01	2398611	DI 1SS254
Q914	2320637	TR 2SA673C/D SI 80MHZ 400MW	DS02	2398611	DI 1SS254
Q915	2312177	TRANSISTOR 2SD 2375 LD P (HHEA MD)	DS03	2398611	DI 1SS254
			DS04	2398611	DI 1SS254
		DIODES	DS05	2398611	DI 1SS254
			DS06	2398611	DI 1SS254
DA01	2398611	DI 1SS254	DS07	2398611	DI 1SS254
DA02	2398611	DI 1SS254	DS08	2398611	DI 1SS254
DA03	2339812M	DIODE-ZENER HZS3A2	DS09	2398611	DI 1SS254
DA04	2339812M	DIODE-ZENER HZS3A2	DS10	2339839M	ZD HZS5C3
DA05	2398611	DI 1SS254	DS11	2398611	DI 1SS254
DA06	2398611	DI 1SS254	DS12	2398611	DI 1SS254
DA07	2339812M	DIODE-ZENER HZS3A2	DS13	2398611	DI 1SS254
DA08	2339812M	DIODE-ZENER HZS3A2	DS14	2339839M	ZD HZS5C3
DA09	2339889	ZD HZS12C3	DS16	2398611	DI 1SS254
DA10	2339889	ZD HZS12C3	DS17	2398611	DI 1SS254
DA70	2339889	ZD HZS12C3	DS18	2398611	DI 1SS254
DA71	2339889	ZD HZS12C3	DS19	2398611	DI 1SS254
DC01	2398611	DI 1SS254	DS20	2339839	ZD HZS5C3
DC02	2398611	DI 1SS254	DX01	2398611	DI 1SS254
DC03	2339889	ZD HZS12C3	DY01	2398611	DI 1SS254
DE01	2398611	DI 1SS254	DY02	2339889	ZD HZS12C3
DE02	2398611	DI 1SS254	DY03	2339889	ZD HZS12C3
DE03	2398611	DI 1SS254	DY04	2339889	ZD HZS12C3
DE04	CH00151M	DIODE DSM1SD2	DY05	2339889	ZD HZS12C3
DE05	CH00151M	DIODE DSM1SD2	DY71	2339889	ZD HZS12C3
DE06	CH00151M	DIODE DSM1SD2	D002	2339889	ZD HZS12C3
DE07	CH00151M	DIODE DSM1SD2	D003	2339889	ZD HZS12C3
DF01	2398611	DI 1SS254	D004	2339889	ZD HZS12C3
DF02	2398611	DI 1SS254	D005	2339889	ZD HZS12C3
DF03	2398611	DI 1SS254	D006	2339889	ZD HZS12C3
DF04	2398611	DI 1SS254	D008	2398611	DI 1SS254
DF05	2398611	DI 1SS254	D009	2398611	DI 1SS254
DF06	2398611	DI 1SS254	D010	2398611	DI 1SS254
DK03	2339551	DI EK14	D011	2398611	DI 1SS254
DK04	CH00172M	DIODE DFM1SD2	D013	2398611	DI 1SS254
DK05	CH00172M	DIODE DFM1SD2	D014	2398611	DI 1SS254
DK06	2334324	ZD RD36EB3	D015	2331827M	ZD HZ-9 (C1)
DK07	2334324	ZD RD36EB3	D016	2398611	DI 1SS254
DK08	2334324	ZD RD36EB3	D017	2398611	DI 1SS254
DK09	2334324	ZD RD36EB3	D018	2398611	DI 1SS254
DK10	2334324	ZD RD36EB3	D021	2398611	DI 1SS254

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SYMBOL NO.	PART NO.	PART DESCRIPTION
D023	2398611	DI 1SS254
D024	2398611	DI 1SS254
D025	2398611	DI 1SS254
D026	2398611	DI 1SS254
D027	2339839	ZD HZS5C3
D028	2398611	DI 1SS254
D031	2398611	DI 1SS254
D032	2398611	DI 1SS254
D033	2339849	DIODE-ZENER HZS6C3
D034	2335991	ZD HZT-33
D035	2339889	ZD HZS12C3
D036	2398611	DI 1SS254
D037	2398611	DI 1SS254
D038	2398611	DI 1SS254
D039	2398611	DI 1SS254
D040	2398611	DI 1SS254
D041	2398611	DI 1SS254
D301	2398611	DI 1SS254
D302	2339855	ZD HZS7B2
D303	2398611	DI 1SS254
D305	2398611	DI 1SS254
D306	2398611	DI 1SS254
D307	2398611	DI 1SS254
D308	2398611	DI 1SS254
D309	2398611	DI 1SS254
D310	2339839	ZD HZS5C3
D312	2398611	DI 1SS254
D313	2398611	DI 1SS254
D314	2398611	DI 1SS254
D315	2398611	DI 1SS254
D316	2398611	DI 1SS254
D318	2398611	DI 1SS254
D319	2398611	DI 1SS254
D320	2334324	ZD RD36EB3
D401	CH00151M	DIODE DSM1SD2
D402	2398611	DI 1SS254
D403	2398611	DI 1SS254
D404	2398611	DI 1SS254
D405	2398611	DI 1SS254
D406	2398611	DI 1SS254
D407	2398611	DI 1SS254
D408	2398611	DI 1SS254
D409	2398611	DI 1SS254
D410	2398611	DI 1SS254
D411	2398611	DI 1SS254
D501	2398611	DI 1SS254
D502	2398611	DI 1SS254
D503	2398611	DI 1SS254
D504	2339839	ZD HZS5C3
D505	2331827	ZD HZ-9 (C1)
D506	2331827	ZD HZ-9 (C1)
D507	2331827	ZD HZ-9 (C1)
D511	CH00151M	DIODE DSM1SD2
D512	CH00151M	DIODE DSM1SD2
D601	2334243	ZD RD16E(B2)
D602	2331154	ZD HZ12 (A1-3/B1-3/C1-3)
D603	2398611	DI 1SS254
D604	2331807	ZD HZ-6 (C1)
D605	CH00151M	DIODE DSM1SD2
D606	CH00151M	DIODE DSM1SD2
D607	CH00151M	DIODE DSM1SD2
D608	CH00031M	DIODE AU02V1 (HHEA MD) (HSCC MD) (YOKOHAMA)
D609	2334305	ZD RD30E (B4)
D610	2398611	DI 1SS254
D611	2398611	DI 1SS254
D612	2398611	DI 1SS254
D614	2398611	DI 1SS254
D615	2398611	DI 1SS254
D616	2398611	DI 1SS254
D701	2398611	DI 1SS254
⚠ D702	2348511	DIODE RS3FS
⚠ D703	2359371	DIODE S3L60 (HHEA MD) (YOKOHAMA)
⚠ D704	2359371	DIODE S3L60 (HHEA MD) (YOKOHAMA)
D705	CH00041M	DIODE ES1FV1 (HHEA MD) (YOKOHAMA)
D706	CH00041M	DIODE ES1FV1 (HHEA MD) (YOKOHAMA)
⚠ D708	CH00031	DIODE AU02 (280V) (HHEA MD) (HSCC MD)
⚠ D709	CH00031M	DIODE AU02V1 (HHEA MD) (HSCC MD) (YOKOHAMA)
⚠ D710	2335042	ZD HZ22 (2L)
D711	2339612M	ZD HZS3BLL
D712	CH00151M	DIODE DSM1SD2
D713	2398611	DI 1SS254
D714	CH00172M	DIODE DFM1SD2
D715	2339887	DIODE-ZENER HZS12C1
D716	2398611	DI 1SS254
D717	2398611	DI 1SS254
D718	2398611	DI 1SS254
D719	2398611	DI 1SS254
D801	2331827	ZD HZ-9 (C1)
D802	23383211	DI 1SS270
D805	23383211	DI 1SS270
D831	2331827	ZD HZ-9 (C1)
D832	23383211	DI 1SS270
D833	23383211	DI 1SS270
D834	2331827	ZD HZ-9 (C1)
D861	2331827	ZD HZ-9 (C1)
D862	23383211	DI 1SS270
D863	23383211	DI 1SS270
D864	2331827	ZD HZ-9 (C1)
⚠ D901	2342061	DI D3SB(A)60
D902	CH00172M	DIODE DFM1SD2
D903	2398611	DI 1SS254
D904	2398611	DI 1SS254
D905	CH00172M	DIODE DFM1SD2
D906	2334304	ZD RD30EB3
D907	2331827	ZD HZ-9 (C1)
D909	CH00151M	DIODE DSM1SD2
D912	2339885	ZD HZS12B2
⚠ D913	2359401	DIODE FMP-G12S
⚠ D914	2359401	DIODE FMP-G12S
⚠ D915	2359401	DIODE FMP-G12S
⚠ D916	2349861	DI FMU-G16S
⚠ D917	2359401	DIODE FMP-G12S
⚠ D918	2359401	DIODE FMP-G12S
D920	CH00151M	DIODE DSM1SD2
D921	2339222	ZD HZS27-2L
D922	2339961M	DIODE ZENER HZS30-1 TA (HHEA MD)
D923	2398611	DI 1SS254
D924	2339855	ZD HZS7B2
D925	2398611	DI 1SS254
D926	2398611	DI 1SS254
D927	2398611	DI 1SS254
D928	2339892M	ZD HZS15-2 TA
D929	2398611	DI 1SS254
D930	2398611	DI 1SS254
D931	2398611	DI 1SS254
⚠ D932	2339961M	DIODE ZENER HZS30-1 TA (HHEA MD)
D933	2398611	DI 1SS254
⚠ D934	2339042	ZD HZS7A2L
D935	2398611	DI 1SS254
D936	2398611	DI 1SS254
D937	2398611	DI 1SS254
D938	2398611	DI 1SS254
D939	2398611	DI 1SS254
D940	2339981	DIODE-ZENER HZS36-1
D941	CH00172M	DIODE DFM1SD2
D942	CH00172M	DIODE DFM1SD2
D943	2398611	DI 1SS254
D944	2398611	DI 1SS254
D945	2398611	DI 1SS254
D946	CH00151M	DIODE DSM1SD2
D947	CH00151M	DIODE DSM1SD2
D948	CH00151M	DIODE DSM1SD2
D949	CH00151M	DIODE DSM1SD2

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SYMBOL NO.	PART NO.	PART DESCRIPTION	SYMBOL NO.	PART NO.	PART DESCRIPTION
D950	2339697	LED SLH-56MC35H			**COILS**
D951	2339697	LED SLH-56MC35H			
D952	2339697	LED SLH-56MC35H	LA02	2123763	RADIAL COIL 100MH
D953	2339697	LED SLH-56MC35H	LA03	2123763	RADIAL COIL 100MH
D954	2339697	LED SLH-56MC35H	LC01	2123763	RADIAL COIL 100MH
D955	2331785	DIODE-ZENER HZ4(B2)	LC02	2123109M	LAL02 AXIAL COIL 33MH
D956	2339983M	DIODE ZENER HZS36-3 TA (HHEA MD)	LE01	2123103M	LAL AXIAL COIL 10 MICRO H
D957	2398611	DI 1SS254	LE02	2123468	FERRITE BEADS CORE LEAD 0.8
D958	2398611	DI 1SS254	LE03	2123468	FERRITE BEADS CORE LEAD 0.8
D959	CH00172M	DIODE DFM1SD2	LE04	2123468	FERRITE BEADS CORE LEAD 0.8
D968	2339892M	ZD HZS15-2 TA	LK01	2123462M	FERRITE BEADS CORE
D970	2339881M	ZD HZS12A1	LK02	2123462M	FERRITE BEADS CORE
D971	2339892M	ZD HZS15-2 TA	LK04	2122929	LAL AXIAL COIL
D972	2398611	DI 1SS254	LK05	2122929	LAL AXIAL COIL
D973	2331785	DIODE-ZENER HZ4(B2)	LK06	2122929	LAL AXIAL COIL
D974	2334304	ZD RD30EB3	LK07	2122929	LAL AXIAL COIL
D975	2339693	LED SLH-56VC35H	LK08	2122929	LAL AXIAL COIL
D976	2339855	ZD HZS7B2	LK09	2122929	LAL AXIAL COIL
D977	2398611	DI 1SS254	LK10	2122929	LAL AXIAL COIL
D978	2339942M	DIODE ZENER HZS24-2 TA	LK11	2122929	LAL AXIAL COIL
DL01	2339855	ZD HZS7B2	LL01	2123781	FILTER COIL
DL02	2339855	ZD HZS7B2	LS01	2123461	FERRITE BEADS CORE
DL03	2339855	ZD HZS7B2	LS02	2123461	FERRITE BEADS CORE
DL04	2339855	ZD HZS7B2	LS03	2123461	FERRITE BEADS CORE
DL05	2339855	ZD HZS7B2	LS04	2123781	FILTER COIL
DL06	2339855	ZD HZS7B2	LS05	2123781	FILTER COIL
DL07	2339855	ZD HZS7B2	LS06	2123781	FILTER COIL
DL08	2339855	ZD HZS7B2	LS07	2123781R	FILTER COIL
DL10	2398611	DI 1SS254	LS08	2123781R	FILTER COIL
DL11	2398611	DI 1SS254	LS09	2123781R	FILTER COIL
DL12	2398611	DI 1SS254	LS12	2123781R	FILTER COIL
DL13	2398611	DI 1SS254	LS13	2123781R	FILTER COIL
DL14	2398611	DI 1SS254	LS14	2123781R	FILTER COIL
DL15	2398611	DI 1SS254			
DL16	2398611	DI 1SS254	LW01	2123781	FILTER COIL
DL17	2398611	DI 1SS254	LX01	2123105F	LAL AXIAL COIL
			LX02	2123116M	LAL AXIAL COIL 100 MICRO H +-10%
		TRANSFORMERS	LX03	2123109M	LAL02 AXIAL COIL 33MH
			LX04	2123763	RADIAL COIL 100MH
⚠ T701	2260291	HORIZONTAL DRIVE TRANSFORMER	LX05	2123763	RADIAL COIL 100MH
⚠ T702	2436493	FLYBACK TRANSFORMER	LX06	2123763	RADIAL COIL 100MH
⚠ T703	2272762	SPC TRANSFORMER	LX07	2123763	RADIAL COIL 100MH
⚠ T901	BT00161	POWER TRANSFORMER (HHEA MD)	LX08	2123763	RADIAL COIL 100MH
⚠ T902	BT00141	SWITCHING TRANSFORMER (HHEA MD)	LX09	2123763	RADIAL COIL 100MH
			LX10	2123763	RADIAL COIL 100MH
		FUSES	LX11	2123109M	LAL02 AXIAL COIL 33MH
			LY01	2123781	FILTER COIL
⚠ F902	2722358	FUSE 5A	LY03	2123763	RADIAL COIL 100MH
⚠ F903	FN00071R	FUSE 5A (HHEA MD)	LY04	2123763	RADIAL COIL 100MH
⚠ F905	2722389M	FUSE 4A	L001	2123781	FILTER COIL
⚠ F906	2722353	FUSE 1.6A	L003	2123763	RADIAL COIL 100MH
			L004	2123781	FILTER COIL
		COMPOUND COMPONENTS	L302	2123116M	LAL AXIAL COIL 100 MICRO H +-10%
			L303	2123763	RADIAL COIL 100MH
⚠ EFPK	AZ00003	CRX FOCUS PACK	L402	2123461	FERRITE BEADS CORE
HM01	2574762	REMOTE CONTROL RECEIVER	L403	2123461	FERRITE BEADS CORE
H001	2791754	DSS306-55B101M	L404	2123461	FERRITE BEADS CORE
H002	2791754	DSS306-55B101M	L601	2123461	FERRITE BEADS CORE
H003	2791754	DSS306-55B101M	L701	BH00212R	FILTER COIL (HHEA MD)
H004	2791754	DSS306-55B101M	L702	2771893	FERRITE BEADS CORE
H005	2791754	DSS306-55B101M	L703	2771892	FERRITE BEADS CORE 004
H006	2791754	DSS306-55B101M	L704	2771892	FERRITE BEADS CORE 004
H008	2791754	DSS306-55B101M	L705	2124181	CHOKE COIL
H009	2791754	DSS306-55B101M	L706	2120484	FILTER COIL
H010	2791754	DSS306-55B101M	L707	2122095	FILTER COIL 27 MICRO H
H011	2791754	DSS306-55B101M	L708	2120482	FILTER COIL 100 MICRO H +-10%
H012	2791754	DSS306-55B101M	L709	2122211	FILTER COIL 12 MICRO H +-10%
⚠ H901	2793312	CAPRISTOR	L710	BZ00315	LINEARITY COIL (HHEA MD)
H902	2793312	CAPRISTOR	L711	BZ00314	LINEARITY COIL 140UH
U002	HP00091	P IN P UNIT KC-010S (HHEA MD)	L803	2123763	RADIAL COIL 100MH
UKDG	UX01361	DIGITAL CONV. UNIT (HC2061 ASS'Y)	⚠ L901	BZ00571	LINE FILTER (HHEA MD)
			⚠ L902	BZ00561	LINE FILTER (HHEA MD)
			⚠ L903	BZ00571	LINE FILTER (HHEA MD)

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SYMBOL NO.	PART NO.	PART DESCRIPTION
L904	2122653	FERRITE BEADS CORE
L907	BH00201R	FILTER COIL (HHEA MD)
L908	BH00201R	FILTER COIL (HHEA MD)
L909	BH00201R	FILTER COIL (HHEA MD)
L912	BH00201R	FILTER COIL (HHEA MD)
L913	BH00201R	FILTER COIL (HHEA MD)
L916	BH00214R	FILTER COIL 100MH
L917	BH00214R	FILTER COIL 100MH
L918	BH00214R	FILTER COIL 100MH
L923	BH00212R	FILTER COIL (HHEA MD)
L924	BH00214R	FILTER COIL 100MH
L925	BH00214R	FILTER COIL 100MH
L926	2161152	FILTER COIL
		SWITCHES
SM01	FE00061	1P KEY SWITCH (HHEA MD)
SM02	FE00061	1P KEY SWITCH (HHEA MD)
SM03	FE00061	1P KEY SWITCH (HHEA MD)
SM04	FE00061	1P KEY SWITCH (HHEA MD)
SM05	FE00061	1P KEY SWITCH (HHEA MD)
SM06	FE00061	1P KEY SWITCH (HHEA MD)
SM07	FE00061	1P KEY SWITCH (HHEA MD)
SM08	FE00091	LIGHT TOUCH SWITCH (HHEA MD)
SM09	FE00091	LIGHT TOUCH SWITCH (HHEA MD)
S301	FD00011	SLIDE SWITCH
S901	2640576	RELAY (HHEA MD)
		MISCELLANEOUS
1	PH02571	ULTRA CONTROL PANEL ASS'Y
1	PH02573	50SX7PA CONTROL PANEL ASS'Y
4	NA03233	LENS CRT METAL
5	NJ01361	SENSOR HOLDER BASE (CABINET MOUNT)
6	NJ01301	SENSOR HOLDER
7	FT00001	SOLAR BATTERY (8 LOCATIONS)
8	H311061	SPEAKER BOX
9	4524911	HEXAGON FLANGEHEAD 4X12
12	4137977	4 X 25 SELF TAPPING SCREW
13	KS00044	MIRROR (46UX20BA/21KA)
13	KS00045	MIRROR (50UX22BA/23KA, 50SX7PA)
13	KS00161	MIRROR (60SX10BA/11KA)
15	4520771	4X18 TAPPING SCREW WITH WASHER
16	4520772	4 X 14 HEX HEAD SCREW
17	81481100	8 X 1 DRYWALL SCREW
19	6202AAB61	MIRROR CLEAT (60SX10BA/11KA)
20	4137975	4X16 TAPPING SCREW WITH WASHER
21	QD01361	CABINET ASS'Y (46UX20BA)
21	QD01362	CABINET ASS'Y (46UX21KA)
21	QD01363	CABINET ASS'Y (50UX22BA)
21	QD01364	CABINET ASS'Y (50SX7PA)
21	QD01365	CABINET ASS'Y (60SX10BA)
21	QD01371	CABINET ASS'Y (50UX23KA)
21	QD01372	CABINET ASS'Y (60SX11KA)
22	QD01531	BACK COVER (EXCEPT 60SX10BA/11KA)
23	H810202	8 X 3/4 PAN HEAD DRYWALL SCREW (EXCEPT 60SX10BA/11KA)
24	55050006	MIRROR BOARD ASS'Y (60SX10BA/11KA)
26	H420781	MIRROR HANGER (60SX10BA/11KA)
27	NT00461	SCREEN FRAME ASS'Y "B" (46UX20BA/21KA)
27	NT00462	SCREEN FRAME ASS'Y "B" (50UX22BA)
27	NT00463	SCREEN FRAME ASS'Y "B" (50SX7PA)
27	NT00464	SCREEN FRAME ASS'Y "B" (60SX10BA)
27	NT00471	SCREEN FRAME ASS'Y (50UX23KA)
27	NT00472	SCREEN FRAME ASS'Y (60SX11KA)
30	PH00574	DECO PANEL (50UX23KA)
30	PH00575	DECO PANEL (60SX11KA)
⚠ 31	KQ00162K	LENS SASS CPC RG (46UX20BA/21KA, 50UX22BA/23KA)
⚠ 31	KQ00164K	LENS SASS CPC RG2 (60SX10BA/11KA, 50SX7PA)
⚠ 32	KQ00162K	LENS SASS CPC RG (46UX20BA/21KA, 50UX22BA/23KA)
⚠ 32	KQ00166K	LENS (60SX10BA/11KA, 50SX7PA)
⚠ 33	KQ00161K	LENS SASS CPC B (46UX20BA/21KA, 50UX22BA/23KA)
⚠ 33	KQ00161K	LENS SASS CPC B (60SX10BA/11KA, 50SX7PA)
34	QG00221	REAR COVER ASS'Y (46UX20BA/21KA)
34	QG00222	REAR COVER ASS'Y (50UX22BA/23KA)
34	QG00224	REAR BOARD ASS'Y (50SX7PA)
34	H512193	REAR BOARD ASS'Y (60SX10BA/11KA)
35	33100010	MIDDLE BACK COVER (60SX10BA/11KA)
36	33100009	UPPER BACK COVER (60SX10BA/11KA)
⚠ 40	UE01551	LENS CRT BLOCK ASS'Y (R) (46UX20BA/21KA, 50UX22BA/23KA)
⚠ 40	UE01561	LENS CRT BLOCK ASS'Y (R) (50SX7PA)
⚠ 40	UE01564	LENS CRT BLOCK ASS'Y (R) (60SX10BA/11KA)
⚠ 41	UE01552	LENS CRT BLOCK ASS'Y (G) (46UX20BA/21KA, 50UX22BA/23KA)
⚠ 41	UE01562	LENS CRT BLOCK ASS'Y (G) (60SX10BA/11KA, 50SX7PA)
⚠ 42	UE01553	LENS CRT BLOCK ASS'Y (B) (46UX20BA/21KA, 50UX22BA/23KA)
⚠ 42	UE01563	LENS CRT BLOCK ASS'Y (B) (50SX7PA)
⚠ 42	UE01565	LENS CRT BLOCK ASS'Y (B) (60SX10BA/11KA, 50SX7PA)
45	KR00271	SCREEN ASS'Y (46UX20BA/21KA)
45	KR00272	SCREEN ASS'Y (50UX22BA/23KA, 50SX7PA)
45	KR00273	SCREEN ASS'Y (60SX10BA/11KA)
47	H311035	SPEAKER GRILL ASS'Y "B" (46UX20BA/21KA)
47	H311036	SPEAKER GRILL ASS'Y "B" (50UX22BA,50SX7PA)
47	H311037	SPEAKER GRILL ASS'Y (50UX23KA)
47	32110022	SPEAKER GRILL ASS'Y "B" (60SX11KA)
47	32110023	SPEAKER GRILL ASS'Y "B" (60SX10BA)
55	H420671	MIRROR METAL A (EXCEPT 60SX10BA/11KA)
56	H420681	MIRROR METAL B (EXCEPT 60SX10BA/11KA)
	PH02301	TERMINAL HOLDER ASS'Y (HHEA MD)
	3821733	CONTROL DOOR
	3875771	LATCH 4T02 NYLON
	PC01201	CONTROL BUTTON
	4519511	4X12 TAPPING SCREW
	4519503	3X12 TAPPING SCREW
	4159427	3X10 TAPPING SCREW WITH WASHER
	3204182	R/C LENS
	3700921	475T LAMP LENS A
	3827874	INDOOR PLATE
	3827875	DOOR PLATE
	3742921	PLASTIC RIVET
	4329271	WASHER (F)
	4522901	NUT
	4517511	3X14 TAPPING SCREW
⚠ EANT	HC00021	ANTENNA SWITCH (HHEA MD)
EF92	2721351	FUSE HOLDER
EF96	2721351	FUSE HOLDER
ES1	EF02233	SENSOR WIRE (CO-09C-N2R0-322)
ES2	EF02242	SENSOR WIRE (CO-10C-N2R0-262)
ES3	EF02253	SENSOR WIRE (CO-06C-N2R0-152)
E10	2776542	VM MAGNET
⚠ E12	BY00441	DEFLECTION YOKE
E301	HL00211	REMOTE CONTROL CLU-951MP
⚠ E801	2698671	CPT SOCKET
⚠ E831	2698671	CPT SOCKET
⚠ E861	2698671	CPT SOCKET
E9BN	4520883	M3X12 SCREW WITH WASHER
E9DN	4520883	M3X12 SCREW WITH WASHER
E9IN	4520883	M3X12 SCREW WITH WASHER
E9IS	KL00051	IC SPRING
⚠ E901	2972841	POWER SUPPLY CORD (HHEA MD)
E902	3772201	AC CORD HOLDER

PRODUCT SAFETY NOTE: Components marked with a ⚠ have special characteristics important to safety. Before replacing any of these components, read carefully, the PRODUCT SAFETY NOTICE of this Service Manual. Don't degrade the safety of the receiver through improper servicing.

SYMBOL NO.	PART NO.	PART DESCRIPTION
E903	3739671	CORD HOLDER
⚠ GF01	CJ00071R	SPARK GAP
⚠ G701	CJ00071R	SPARK GAP
⚠ G801	CJ00071R	SPARK GAP
⚠ G802	CJ00071R	SPARK GAP
⚠ G831	CJ00071R	SPARK GAP
⚠ G832	CJ00071R	SPARK GAP
⚠ G861	CJ00071R	SPARK GAP
⚠ G862	CJ00071R	SPARK GAP
JS01	ER00121	LEVER TERMINAL (HHEA MD)
JY01	ES00001	13P PIN JACK WITH S TERMINAL (HHEA MD)
JY02	ES00021	3P PIN JACK WITH S TERMINAL (HHEA MD)
NE02	4520883	M3X12 SCREW WITH WASHER
NF02	4520883	M3X12 SCREW WITH WASHER
NK03	4520883	M3X12 SCREW WITH WASHER
NK06	4520885	M3X16 SCREW
NK11	4520883	M3X12 SCREW WITH WASHER
NS01A	4520883	M3X12 SCREW WITH WASHER
NS02	3787482	PCB HOLDER
NS03	3787482	PCB HOLDER
NS04	3787482	PCB HOLDER
N201	QR02276	INSTRUCTION BOOK
N402	4520883	M3X12 SCREW WITH WASHER
N502	4520883	M3X12 SCREW WITH WASHER
N602	4520883	M3X12 SCREW WITH WASHER
N604	4520883	M3X12 SCREW WITH WASHER
N702	4520883	M3X12 SCREW WITH WASHER
N704	4159425	3X16 TAPPING SCREW
N730	4159427	3X10 TAPPING SCREW WITH WASHER
N801	3763751	SK BINDER
N803	4520883	M3X12 SCREW WITH WASHER
PB	2661756	1P PLUG PIN WITH BASE
PB	2661756	1P PLUG PIN WITH BASE
PDH	2959054	5P PLUG
PFJ	2902266	7P SUB MINI PLUG PIN
PG1	2663821	2P PLUG PIN
PI1	2663821	2P PLUG PIN
PI2	2663821	2P PLUG PIN
PMB	2665272	4P PLUG PIN WITH BASE
PMG	2665272	4P PLUG PIN WITH BASE
PMR	2665272	4P PLUG PIN WITH BASE
PP31	2661751	PLUG PIN WITH BASE
PR	2661753	PIN PLUG WITH BASE
PSA1	2902275	PLG-15P2R5VPWB
PSA2	2902275	PLG-15P2R5VPWB
PSC	2661752	PLUG PIN
PSD1	2674631	5P CONNECTOR
PSD3	2674634	8P CONNECTOR
PSD4	2674635	10P CONNECTOR
PSD6	2674631	5P CONNECTOR
PTS	2663821	2P PLUG PIN
PY2	2902263	4P SUB MINI PLUG PIN
PY2	2902263	4P SUB MINI PLUG PIN
P802	2661756	1P PLUG PIN WITH BASE
P832	2661756	1P PLUG PIN WITH BASE
P862	2661756	1P PLUG PIN WITH BASE
SA1	EF02891	C0-15C-B2R5-181
SA2	EF02891	C0-15C-B2R5-181
U001	2429691	FRONTEND V8-A68FT (HHEA MD) (HSCC MD)
⚠ U401	GK00101	SPEAKER (SP-05M C057PT811-10)
⚠ U402	GK00091	SPEAKER (SP-12M C120RB804-10)
⚠ U403	GK00101	SPEAKER (SP-05M C057PT811-10)
⚠ U404	GK00091	SPEAKER (SP-12M C120RB804-10)
⚠ U405	GK00111	SPEAKER (SP-7*12D C121RB802-10)
V1B	DE00116	P16LEN00BMB (U) B (46UX20BA/21KA, 50UX22BA/23KA)
V1B	DE00823	P16LGD00BMB (B) (60SX10BA/11KA, 50SX7PA)
V1G	DE00115	P16LEN00HLA (U) G (46UX20BA/21KA, 50UX22BA/23KA)
V1G	DE00822	P16LGD00HLA (G) (60SX10BA/11KA, 50SX7PA)
V1R	DE00114	P16LEN00RFA (U) R (46UX20BA/21KA, 50UX22BA/23KA)
V1R	DE00821	P16LGD00RFA (R) (60SX10BA/11KA, 50SX7PA)
XS01	2786585	CRYSTAL
XX01	2791501	CRYSTAL HC-49/U
XX02	BJ00141	BPF COIL 3.58MHZ
XX03	BJ00112	LPF COIL 6.0MHZ
X001	2168831	CRYSTAL
X301	2786685	CRYSTAL
X501	2791501	CRYSTAL HC-49/U
	UE01541	LENS CRT CHASSIS B. ASS'Y (46UX20BA/21KA, 50UX22BA/23KA)
	UE01542	LENS CRT CHASSIS B. ASS'Y (50SX7PA)
	UE01543	LENS CRT CHASSIS B. ASS'Y (60SX10BA/11KA)
	H310353	DIGITAL CONV. JIG SCREEN (46")
	H310354	DIGITAL CONV. JIG SCREEN (50")
	H310355	DIGITAL CONV. SCREEN (60")

NOTES